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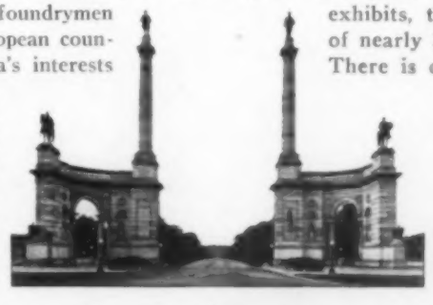
"To Advance the Foundry Business"

Philadelphia Greets Foundrymen

BACK again in Philadelphia for the greatest of all its conventions and exhibitions—in the city where it was born 23 years ago—the American Foundrymen's association, thriving and alive with the busy spirit of the times bears evidence of the wisdom of co-operative organization.

Its success, measured in experience, the cumulative result of the exchange of knowledge, or translated in a monetary sense, is all that its founders and the pioneers of the casting industry might well have wished for it. Its prestige established, continuation now must be its watchword, continuation along the constructive and progressive lines which have placed it among the foremost trade organizations in the world, and which must make it a still more active force for the welfare of its members and the good of those whose interests are bound up with theirs.

A significant feature of the convention this year, will be the attendance of a number of visitors from abroad. The association's work and its exhibits are commanding the attention of some of the most prominent firms, foundrymen and metallurgists in European countries. Industrial America's interests are linked inseparably with those of other nations, and perhaps this quickened spirit and recognition of far-reaching relationship may foreshadow a still greater association, an international association to include the representative foundrymen of the world.



Thus time improves perspective. The declaration of dependence, that pledge of mutuality and helpfulness on the part of a small group of foundrymen in Philadelphia in 1896 was the foundation of an association which in 1919 has attained international fame, just as the principles of government enunciated in that city 143 years before now ring throughout the world.

Many of those identified with the organization of the association still are included among its membership. For those who have worked unstintingly "for the advancement of the foundry business" the twenty-fourth annual convention must be a source of great gratification.

The first convention was held in the Manufacturers' club, and there was no exhibit of foundry equipment. In 1916 in Cleveland 38,000 square feet of space was occupied by the exhibits; in 1917 in Boston, 44,000 square feet; in 1918 in Milwaukee, 42,000. And more than a month ago as much as 60,000 square feet of space had been reserved for the convention of 1919. Considered from the standpoint of exhibits, this represents a growth of nearly 33 per cent in one year! There is cause for congratulation. But the big thought that must dominate the convention is progress, continued progress and a progress that counts the achievements of the past only as guide-posts to a greater future.

Quaker City, Association's Cradle

Men Prominent in the Formation of Philadelphia's Local Foundry Society Were Instrumental in Bringing About the First National Convention—Growth and Progress Throughout the Industry Have Followed

PHILADELPHIA'S history is intimately bound up with the birth and growth of the nation. The city is justly cherished as the birthplace and existing symbol of American independence. Established to champion the radical and then despised principle of religious freedom, the community continually has been a pioneer in social and industrial advancement. The first daily newspaper, the first circulating library, the first corporate bank, the first National congress, President and National capital, and the immortal Declaration all are Philadelphia's own by history and association.

It is eminently fitting that Philadelphia, the cradle of independence, should have been the birthplace of the American Foundrymen's association. This statement sounds trite, but an analogy exists. Representatives from 13 aggrieved colonies of Great Britain chose Philadelphia in which to meet in council for protection. There they banded themselves together for mutual support and fathered certain principles which formed the groundwork of the nation. One hundred and twenty years later another group was gathered together, likewise for mutual help. These latter, representatives of the great casting industry, did not fear the oppression of a regal tyrant, nor the active opposition of any outside power. They were, however, bound by the shackles of adherence to age-old practice and held back by petty jealousy between individuals from the benefits of mutual co-operation and the interchange of ideas. Called together by Philadelphians, the foundrymen met in the first national convention in May, 1896, to seek means of correcting existing abuses and of advancing the industry through the interchange of ideas.

Six years before, in the later months of 1890, a few prominent foundrymen of Philadelphia had met together to discuss problems of common interest connected with the conduct of their business. These men for want of a better meeting place, congregated in a bar room. The idea which brought them together was the promotion of better fellowship among men in the same industry. Their underlying hope was that acquaintanceship would militate against price cutting, as it was ever easier to practice unfair business methods against strangers. These early meetings represented the first feeble stirring of the spirit which brought forth the American Foundrymen's association. The sessions were not always well attended for occasionally only the president and secretary met at the appointed time, but at every scheduled meeting "two or three were gathered together."

In July, 1891, the organization meeting of the Philadelphia Foundrymen's association was held in response to a call sent out by Howard Evans then with the J. Emerick Co. Among those found on the first official membership list are Harry Asbury; Thomas Glover, Morris Tasker & Co.; Harry Ruhland, Ruhland & Redman; Josiah Thompson, Josiah Thompson & Co.; A. C. Mott, Abram Cox Stove Co.; A. E. Outerbridge Jr., William Sellers & Co.; A. C. Pessano, Geo. V. Cresson Co.; Godfrey R. Redmann, Otis Elevator Co.; W. F. Sauter, American Engineering Co.; W. H. Ridgway, C. Ridgway & Son Co., Coatsville, Pa.; James S. Stirling, Hilles & Jones Co., Wilmington, Del.; Walter T. Bickley, Penn Steel Casting & Machinery Co., Chester, Pa.; J. S. Hibbs, J. W. Parson Co.; Samuel J. Creswell, S. T. Creswell Iron Works; S. A. Waters, Goodell & Waters; Thomas Devlin, Thomas Devlin & Co.; James M. Blankley, Way & Blankley; Francis Schumann, Tacony Iron & Metal Co., Tacony, Philadelphia; Justice H. Schwacke, Wm. Sellers & Co.; W. S.

JOHN A. PENTON — FRANCIS SCHUMANN — HOWARD EVANS

These officers of the American Foundrymen's association elected at the first convention in Philadelphia had been strongly instrumental in bringing about the formation of the national organization

Hollowell, Harrison Safety Boiler Co.; E. E. Brown, E. E. Brown & Co.; T. Howard Sheeler, Sheeler-Hemsher Co.; Wilfred Lewis, Tabor Mfg. Co.; J. D. Harvesy, Monarch Engineering & Mfg. Co.

These and a few others formed the nucleus about which the Philadelphia association was built up. Most of them were identified prominently with the growth of the national organization and some few of them still are active along this line.

The bar room meetings were abandoned as being subject to misinterpretation, and a more commodious meeting place was sought and obtained at the Manufacturers' club which had been erected a short time previously. Regular meetings resulted in increased attendance and the association was established upon a firm footing.

In 1896, the Philadelphia Foundrymen's association conceived the idea of a national organization formed of those engaged in the foundry industry. The benefits of the local body were so apparent that it was the earnest desire of those broad-thinking men to bring within its influence all who were engaged in manufacturing castings. Accordingly a movement was started and an active campaign inaugurated which was carried out through the earnest personal efforts of a number of individuals. Chief among these were Francis Schumann and Howard Evans, president and secretary of the Philadelphia association, and John Penton, editor and proprietor of *The Foundry*, which at that time was published in Detroit. The Western Foundrymen's association joined with Philadelphia in arranging for a meeting to form a national body.

The true spirit of Philadelphia, the City of Brotherly Love, was stated in the aims of the meeting set forth in the invitation which was sent to prominent foundrymen in all parts of the United States and Canada. The invitation stated:

"The object of this convention is to bring about a more friendly feeling among the foundrymen of this country and to present and discuss papers on interesting subjects and to encourage the formation of foundry associations in every part of the United States where it is possible to do so, believing in the end good results must follow, the idea being to advance the foundry business in every way."

The ideals upon which this great industrial association was built were correctly stated in this announcement. The interpretation of these ideals and the growth even beyond the hopes of its founders reflect credit upon the vision of those who have consistently adhered to the set purpose, "to advance the foundry business in every way."

In his keynote speech welcoming the delegates on May 12, 1896, Francis Schumann pointed out that those present represented an industry consisting of nearly 4000 separate establishments, employing 120,000 persons. These produced some 2,600,000 castings with a total disbursement for labor of $114,000,000 upon an aggregate invested capital of $115,000,000. He pointed out that the excessive, and in some cases artificial competition had brought a general movement toward combinations for the purpose of combating "unrestrained and dangerous rivalry." The downward course of prices had resulted in deteriorating the character of products and undermining the finer sense of honor in the individuals so competing. The national organization was to correct these conditions.

Landmarks of Progress

NO better evidence is offered of progress in the foundry industry during the last decade than is presented by a contrast of the accompanying program delivered in 1896, *with that prepared for the* 1919 *convention of American foundrymen. The chemistry of iron the use of such common equipment as traveling cranes, compressed air, sand blast and molding machines were just beginning to appear on the horizon of better methods. The influence of the American Foundrymen's association needs no better tribute than that offered by a consideration of the progress made in the industry between the first and twenty-fourth annual meetings.*

The subjects treated upon at the 1896 *meeting were as follows:*

"Chemistry of Iron, with Determinations and Their Value," by Charles James, M. E., of Henry Disston & Sons, Philadelphia, and W. C. Henderson chemist, of Thomas Devlin & Co., Philadelphia.

"The Strength of Cast Iron, with Samples," by W. J. Keep, Detroit, Mich.

"Apprenticeships, Their Value and How to Make New Molders," by D. J. Matlack, of I. P. Morris Co.

"Foundry Cranes, the Different Power Used to Drive Them," accompanied by lantern slides, by A. E. Outerbridge, Jr., of Wm. Sellers & Co., Inc., Philadelphia.

"Acid Open Hearth vs. Basic Open Hearth and the Wahand-Legensel Bessemer Process," by Jos. Hartshorne, M. E., of Pottstown, Pa.

"The Air Compressor for Use in the Foundry," by C. W. Shields, of Ingersoll, Sergeant Drill Co., Easton, Pa.

"Cupolas and Cupola Practice Up to Date," by Dr. Edw. Kirk, Philadelphia.

"Entertainment of the Delegates," by Mr. John Birkinbine, M. E., of Philadelphia.

"Utility and Advancement of Green Dry and Loam Sand Molding," by Thomas D. West, Sharpsville, Pa.

"Gear Molding and Gear Molding Machines," by S. Grove, of Taylor, Wilson & Co., Pittsburgh, Pa.

"The Sand Blast for Cleaning Castings," by Fred C. Brooksbank, of Ward & Nash, Boston, Mass.

"Molding Machines and Their Appreciation," by Harris Tabor, of Tabor Mfg. Co., of Elizabeth, N. J.

It was felt at that time that a more friendly feeling between the men engaged in the same work would tend to more satisfactory prices through the reduction of reckless bidding and a better knowledge of costs of production. Even at this early date the need of standard physical tests for cast iron was strongly expressed. Labor difficulties, too, engaged the attention of the delegates. The question of convict labor was presented and informal conferences between delegates brought out plans to avoid strikes and lockouts and to enforce a universal apprenticeship system. It thus may be seen that the first steps of the organization were directed along the paths of material and practical rather than technical and business advance. The transition and broadening of activities of the association since its inception will be appreciated by those who are familiar with the work of the organization at the present time.

The first meeting was held at the Manufacturers' club, where the guests registered and were assigned a numbered badge. The numbers with the delegates' names to correspond were printed in the *Daily Foundry* which was issued on each of the three days of the convention. Francis Schumann, Tacony Iron & Metal Co., Tacony, Philadelphia, and Howard Evans, J. W. Paxson & Co., Philadelphia, were elected unanimously as chairman and secretary respectively to preside during the meeting. Upon resolution presented by F. A. Riehle, Riehle Bros., Philadelphia, a committee of five was appointed to draw up a suitable constitution to govern the national association. The members of this committee were A. Sorge Jr., Chicago; R. Taylor, Pittsburgh; Frank A. Magee, Boston; J. Best, Montreal, and C. S. Bell, Hillsboro, Ohio.

The discussion of a suitable title for the organization brought out the statement that this was not to be a national association, because such a title might carry the intimation that membership was confined to the United States alone. The hope was expressed that a large number of foundrymen, experts in their line, who were located in Canada, would cooperate in the work of the association. The wisdom of this course has been fully vindicated.

Interesting sessions were held where discussions followed the lines indicated by the program which is shown

on page 101. The demonstration of processes for determining the chemical constituents of iron was stated to be one of the most interesting features of the meeting. The first feeble stirring of interest in the vital scientific control of metal mixtures was evidenced at this time. Previously iron was judged by fracture in most cases and with a few exceptions the effects of silicon, manganese, sulphur and phosphorus were a closed book to the practical foundryman. Pioneers such as W. J. Keep, Thomas D. West and others had begun to exert an influence toward technical knowledge which grew through their activity in the association. The first steps in this direction at the first convention aroused the greatest interest and appreciation among members.

Labor even at that day occasioned anxiety to foundry executives. However, the phases discussed concerned the concrete points of apprenticeship, classes of labor and wages, rather than the broader aspects of increased output, and efficiency. Compressed air was sufficiently novel to invite attention and discussion. Cranes and molding machines still were in the early stages of development. Jib cranes were defended against the opinion sometimes expressed that they were becoming obsolete due to the advances in the "traveling" crane, but the statement was made that the overhead type had its uses in heavy foundries. The generally used cranes of the day were shown to be steam-driven jibs with an occasional electric or hydraulic pillar crane. The paper on molding machines attracted great interest as foundrymen were coming to realize that the fraction of a cent on the cost of making a casting was a most important item in meeting the keen competition that then existed. This factor rather than the saving in manpower was the motive which attracted them to labor-saving machinery.

First Officers Prominent

The third day's session was occupied in discussing the constitution and electing officers. Francis Schumann who had been president of the Philadelphia body since its formation was chosen as the first president of the American Foundrymen's association. Mr. Schumann was at that time in his fifty-second year. He had been an engineer with railroad experience. He served under General Meade in the Army of the Potomac during the Civil War and later had been superintendent and manager of a foundry and machine shop. Mr. Schumann had established the firm of Schumann & Lynch, Tacony, Philadelphia, which later became the Tacony Iron & Metal Co. Mr. Schumann served as president and general manager of this company.

Howard Evans, who was a partner in the firm of J. W. Paxson & Co. and had been in the foundry supply business all of his life, was chosen treasurer of the national organization. At the time of the convention he was secretary of the Philadelphia section and to his energy and ability is due much of the credit for the successful launching of the American Foundrymen's association. John A. Penton, editor and proprietor of *The Foundry*, was elected secretary.

Twenty-three states were represented by 350 delegates registered. The association desired to establish active units in various parts of the country. Accordingly vice presidents were elected to lead the geographical sections as follows: New England, F. W. Gibby, Boston; Middle States, Robert G. Taylor, Pittsburgh; Southern States, Henry Clay Evans, Chattanooga; Central Western States, John M. Sweeney, Chicago; Southwestern States, W. S. Mosher, Dallas, Tex.; Pacific States, Irving Scott, San Francisco; Canada, Joseph Best, Montreal.

Eleven years after this initial meeting the American Foundrymen's association again came together in Philadelphia. In the interim many changes had been made in policy and details of organization but the underlying principles of the body were the same. All questions of labor as concerned wages and hours had been banished and the price question too was dropped as without the scope of a national association. All questions brought before the sessions of the American Foundrymen's association after about 1900 concerned the production of the best possible castings at the lowest shop cost. In 1907 when the second Philadelphia convention was held, the American Foundrymen's association was recognized as a factor in the evolution of the industry. Dr. Richard Moldenke, who was secretary of the association at this time said:

"To the American Foundrymen's

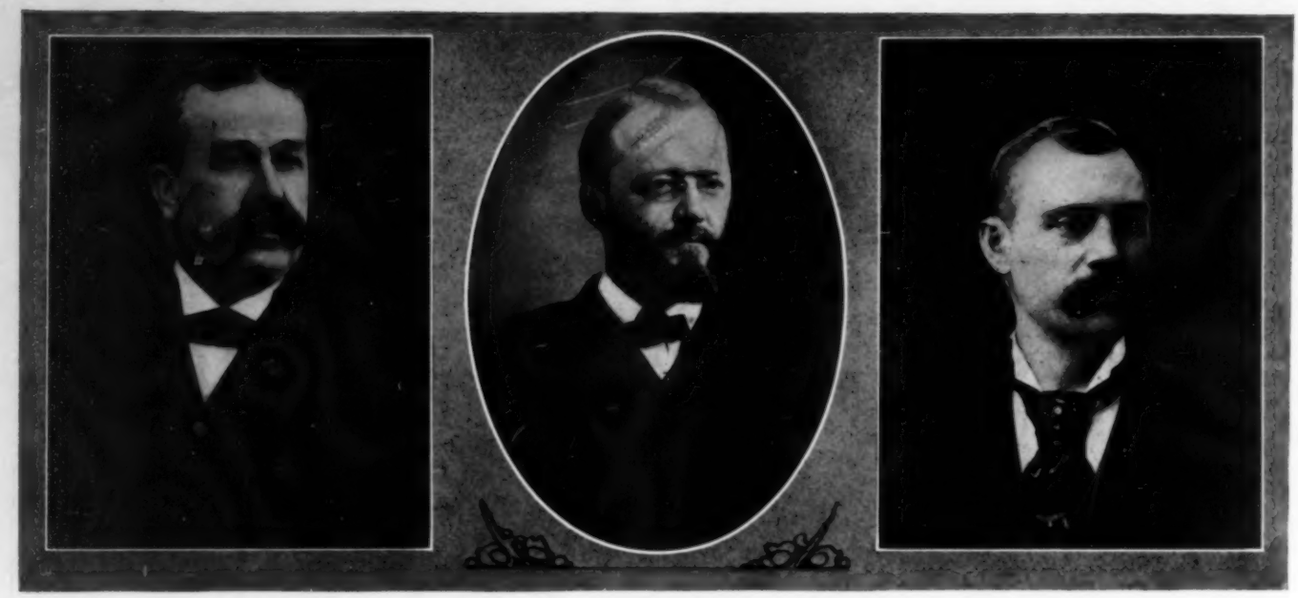
JOSIAH THOMPSON THOMAS D. WEST W. J. KEEP

These men, two of whom were most intimately identified with the development of the science of founding, were among the active delegates to the first convention

Those Who Attended First Convention

Charles Ashbury, Enterprise Mfg. Co., Philadelphia.
Robert Allison, Franklin Iron Works, Port Carbon, Pa.
George R. Allen, Thirteenth and Buttonwood streets, Philadelphia.
Alonzo D. Amsden, Phoenix Foundry, Providence.
William Adams, Wm. Adams & Co., Ninth and Girard avenue, Philadelphia.
James W. Arrote Jr., Standard Mfg. Co., Pittsburgh.
William W. Ackerman, Samuel L. Moore & Sons, Elizabethport, N. J.
E. T. Adams, Juniata Furnace & Foundry Co., Marlborough and Beach streets, Philadelphia.
James Anderson, Sotter Bros., Pottstown, Pa.
K. J. Bougher, J. W. Paxson & Co., Philadelphia.
John Braun, Philadelphia Lawn Mower Co., Twenty-third and Turner streets, Philadelphia.
James H. Blankley, Blankley Bros. & Co., Twenty-second and Allegheny avenue, Philadelphia.
Elmer E. Brown, E. E. Brown & Co., McKean and Meadow streets, Philadelphia.
John T. Brown, Damascus Bronze Co., Pittsburgh.
Andrew Banholzer, Birmingham Machine & Foundry Co., Birmingham, Ala.
T. S. Bishop, Russell & Irwin Mfg. Co., New Britain, Conn.
J. J. Burgen, Lane Mfg. Co., Montpelier, Vt.
John W. Burr, Burr & Houston Co., Brooklyn.
James A. Beckett, W. A. Wood Mowing & Reaping Co., Hoosick Falls, N. Y.
Clinton S. Buckley, Damascus Bronze Co., Pittsburgh.
Joseph Best, Warden King & Son, Montreal, Canada.
John F. Brayer, Co-operative Foundry Co., Rochester, N. Y.
Howard J. Bing, 3737 Filbert street, Philadelphia.
Frank N. Brayer, Co-operative Foundry Co., Rochester, N. Y.
F. C. Brooksbank, Ward & Nash, Riverton, N. J.
Felix Brown Jr., A. & F. Brown, Elizabethport, N. J.
R. D. Berge, Clinton Iron & Steel Co., New York.
James Bailey, Wilmington Malleable Iron Co., Wilmington, Del.
W. P. Barba, Midvale Steel Co., Nicetown, Philadelphia.
C. R. Baird, C. R. Baird & Co., Philadelphia.
C. S. Bell, C. S. Bell Co., Hillsboro, O.
J. A. Buckwalter, the Buckwalter Stove Co., Royersford, Pa.
Robert Blyth, Walker Pratt Mfg. Co., Watertown, Mass.
James T. Bradshaw, Twenty-first and Diamond streets, Philadelphia.
J. W. Booth, American Steel Casting Co., Thurlow, Pa.
A. H. Blackburn, Fuel Economizer Co., Matteawan, N. Y.
A. E. Barlow, Morris & Barlow, Newark, N. J
Charles Bailey, Reliance Steel Casting Co., Pittsburgh.
John Birkinbine, 25 N. E. Penn square, Philadelphia.
T. D. Buckwalter, Buckwalter Stove Co., Royersford, Pa.
William P. Bement, Bement, Miles & Co., Philadelphia.
Richard H. Bate, W. T. Bate & Son, Conshohocken, Pa.
R. Blickenderfer, Lancaster, Pa.
Henry G. Bates, New York.
Albert D. Brown, Chester, Pa.
Archer Rogers Brown, Brown & Warner, New York.
Charles A. Brown, A. & F. Brown, Elizabethport, N. J.
Cyrus Borgner, Twenty-third and Vine streets, Philadelphia.
E. T. Betts, Betts Machine Co., Wilmington, Del.
W. J. Coane, Joseph Dixon Crucible Co., 38 N. Fourth street, Philadelphia.
Robert Caskey, Diller, Caskey & Co., Sixth and Berks streets, Philadelphia.
Mr. Cox, Cramps Brass Foundry, Philadelphia.
Twining Campbell, Paterson, N. J.
Robert J. R. Cullingworth, Wetherill & Co., Chester, Pa.
T. R. Coggeshell, Girard college, Philadelphia.
F. E. Cook, Westinghouse Air Brake Co., Pittsburgh.
Charles N. Choate, Bridgeport Door, Bronze & Metal Co., Bridgeport, Conn.
Theodore Colvin, Providence.
Justice Cox Jr., 218 S. Fourth street, Philadelphia.
A. C. Carleton, Pratt & Whitney Co., Hartford, Conn.
W. W. Cheney, S. Cheney & Son, Manlius, N. Y.
William Carpenter, H. A. Carpenter & Sons, Providence.
W. H. Coffin, Buffalo Foundry Supply Co., Buffalo.
H. A. Carpenter, H. A. Carpenter & Sons, Providence.
A. G. Curtin, L. & R. Wister & Co., Philadelphia.
A. J. Caldwell, Henry R. Worthington, New York.
Charles D. Cramp, William Cramp & Sons, Philadelphia.
W. Y. Cruickshank, Jackson & Woodin Manufacturing Co., Berwick, Pa.
L. M. Codington, Standard Gas Fixture Co., Somerville, N. J.
Millard F. Carr, J. W. Paxson & Co., Philadelphia.
William H. Derbyshire, Bement, Miles & Co., Twenty-first and Callowhill, Philadelphia.
William Dette, Rogers, Brown & Warner, Bullitt building, Philadelphia.
J. M. Darke, General Electric Co., Lynn, Mass.
J. H. Dalton, Walburn, Swenson & Co., Chicago.
Walter Devlin, Philadelphia Hardware & Malleable Iron Co., Philadelphia.
Henry C. Dimond, Bushwell & Giessner, Springfield, O.
J. F. Donaldson, Ingersoll, Sergeant Drill Co., Easton, Pa.
W. J. Devlin, Philadelphia Hardware & Malleable Iron Works, Ninth and Jefferson streets, Philadelphia.
George C. Davies, C. R. Baird & Co., Philadelphia.
Harry Drinkhouse, Devlin & Co., American and Lehigh avenue, Philadelphia.
E. M. Drummond, Drummond Manufacturing Co., Louisville, Ky.
J. K. Dimmick, Anniston Pipe & Foundry Co. Anniston, Ala.
George Danleady, Ingersoll, Sergeant Drill Co., New York.
M. O. Donoghue, Valentine Iron Co., Bellefonte, Pa.
E. E. Durant, G. F. Warner Mfg. Co., New Haven, Conn.
Howard Evans, J. W. Paxson & Co., Philadelphia.
C. N. Elliott, C. N. Elliocott & Co., Philadelphia.
E. Edwards, General Electric Co., Lynn, Mass.
George N. Elliott, Southwark Foundry & Machinery Co., Fifth and Washington avenue, Philade'phia.
W. H. Echternach, foundry of Girard college, Philadelphia.
George S. Emerick, George S. Emerick Co., White Haven, Pa.
Daniel Eagan, American Steel Casting Co., Thurlow, Pa.
Stanley G. Flagg Jr., Stanley G. Flagg & Co., Nineteenth and Pennsylvania avenue, Philadelphia.
William Ferguson, Gates Iron Works, Chicago.
Isaac W. Frank, Frank, Kneeland Machine Co., Pittsburgh.
George Flagg, Stanley G. Flagg & Co.., Philadelphia.
John Fetz, Hanover Foundry & Machine Co., Hanover, Pa.
Edward P. Farrell, Baltimore.
A. I. Findley, The Iron Trade Review, Cleveland.
H. E. Floyd, James R. & Sons, New York.
William E. Fulton, Waterbury Farrell Foundry & Machine Co., Waterbury, Conn.
Y. C. Freed, Royersford Machine Co., Royersford, Pa.
J. W. Friend, Clinton Iron & Steel Co., Pittsburgh.
J. H. Ferguson, Brownell & Co., Philadelphia.
J. T. Friend, Clinton Iron & Steel Co., Pittsborgh.
George W. French, J. J. Mohr, Philadelphia.
F. A. Goodrich, F. A. Goodrich & Co., Detroit.
George H. Gibby, Condor Iron Foundry Co., Boston.
Samuel Taylor Groves, Wilson & Co., Pittsburgh.
F. W. Gibby, Mechanics Foundry Co., Boston.
Max F. Gross, Evening Star, Pa.
Henry M. Garrett, Westinghouse Machine Co., Pittsburgh.
J. H. Gill, Raleigh, N. C.
John H. Glover, Glover Bros., Frankford, Philadelphia.
George S. Goodwin, The "Item," Philadelphia.
William Gisriel, Maryland Brass & Metal Works, Baltimore.
Thomas Glover, Glover Bros., Philadelphia.
Samuel F. Given, Bement, Miles & Co., Twenty-first and Callowhill streets, Philadelphia.
Ralph J. Greider, Paul S. Reeves & Son, Broad and Catherine streets, Philadelphia.
George H. Graham, Oriskany Malleable Iron Co., Oriskany, N. Y.
W. H. Green Jr., Vulcan Iron Works, Chester, Pa.
H. W. Gadd, J. Wesley Pullman, Philadelphia.
John F. Gilliams, U. S. Smelting Co., Philadelphia.
Arthur W. Howe, 420 Bourse building, Philadelphia.
Thomas Hobson, The Iron Age, Philadelphia.
John W. Harrison, Shickels, Harrison & Howard, St. Louis.
F. P. Howe, William Wharton Jr. & Co., Twenty-fifth and Washington avenue, Philadelphia.
Thomas R. Holman, Holyoke Machine Co., Worcester, Mass.
John S. Hill, Obermayer Co., Cincinnati.
T. B. Harkins, T. B. Harkins Foundry Co., Bristol, Pa.
John Hanes, Woodstown, N. J.
James M. Hodge, Crane Iron Works, Catasauqua, Pa.
H. B. Hirsh, Midvale Foundry Co., Allentown, Pa.
Herman Haynsen, Kohler Haynsen & Stehn Mfg. Co., Sheboygan, Wis.
William C. Henderson, Thomas Devlin & Co., Philadelphia.
William A. Harris, Baush & Harris Machine Tool Co., Springfield, Mass.
S. C. Hartpence, Columbia Foundry Co., Philadelphia.
H. Hunsicker, Mt. Penn Stove Works, Reading, Pa.
W. H. Hunt, William Adams & Co., Philadelphia.
George Hetherington, 222 Greenwich street, Philadelphia.
Benjamin F. Hiesland, Marietta Casting Co., Marietta, Pa.
William Hanson, Pennsylvania Iron Works Co., Fiftieth and Merion avenue, Philadelphia.
John C. Hubley, Hubley Mfg. Co., Lancaster, Pa.
C. H. Haeseler, Pedrick & Ayer Co., Tenth and Hamilton streets, Philadelphia.
T. M. Henry, North & Judd Mfg. Co., New Britain, Conn.
Alfred E. Hammer, Malleable Iron Fittings Co., Branford, Conn.
V. L. Hammer, Malleable Iron Fittings Co., Branford, Conn.
Joseph S. Hibbs, J. W. Paxson & Co., Philadelphia.
Amos Jones, Jones & Scullin, Philadelphia.
Frank R. Jones, Jerome, Kelley & Co., Philadelphia.
Charles James, Henry Disston & Sons, Tacony, Philadelphia.
Alex Jarecki, Jarecki Mfg. Co., Erie, Pa.
Jesse Jones, William Cramp & Sons, Philadelphia.
Charles L. Jobb, Londonberry Iron Co., Ltd., Londonberry, N. S.
George T. Johnson, Thomas Iron Co., Hokendauqua, Pa.
Thomas Jones, the Capitol Machine Tool Co., Auburn, N. Y.
James A. Janner Jr., Janner & Steinmetz, Philadelphia.
Henry J. Julian, Gray's Ferry Foundry & Brass Works, Philadelphia.
Thomas Kavanagh, Kavanagh & McDermott, Fifteenth and Lehigh avenue, Philadelphia.
John C. Knoppel, Buffalo Forge Co., Buffalo.
A. F. Koons, Webster, Camo & Co., Akron, O.
Joseph Koons, L. V. R. R. Co., Weatherly, Pa.
W. J. Keep, Michigan Stove Co., Detroit.
T. J. Kelly, Moore, Kelley & Co., Philadelphia.
J. M. Kohler, Kohler Haynsen & Stehn, Sheboygan, Wis.
William T. Koken, Koken Iron Works, St. Louis.
Dr. Edw. Kirk, 535 N. Tenth street, Philadelphia.
F. C. Kuken, George R. Allen, Thirteenth and Buttonwood streets, Philadelphia.
R. B. Kel'y, T. B. Harkins Foundry Co., Bristol, Pa.
W. G. Kimball, S. G. Kimballs Sons, Newburgh, N. Y.
C. Kirchoff, "The Iron Age," New York.
Joseph A. Kelly, Scaife Foundry & Machine Co., Pittsburgh.
T. P. Kelly, T. P. Kelley & Co., New York.
G. B. Keating, G. B. Keating & Co., Philade'phia.
Peter Lindsey, Manayunk, Philadelphia.
Peter Lindsey Jr., Manayunk, Philadelphia.
K. J. Lambert, Syracuse Chilled Plow Co., Syracuse, N. Y.
John A. Logan, Jones & Laughlin, Ltd., Pittsburgh.
George H. Lincoln, G. H. Lincoln & Co., Boston.

(Concluded on Page 105)



A. C. MOTT WALTER WOOD WILLIAM FERGUSON

History is a summation of commanding personalities, and the progress of the industry may be traced by the achievements of individuals who are engaged in its acitivities

association may be directly ascribed the change in the purchase and sale of pig iron by analysis instead of by fracture. The metallurgists all over the world, working in iron and steel, were benefited by the standardizing bureau of the association, originated and watched over by Thomas D. West, an ex-president of this body. The standardized drillings made by this bureau were admitted as authoritative in disputes concerning the correctness of analyses. The work of this bureau has been taken over by the United States government, the drillings of cast iron, duly standardized, being distributed by the bureau of standards at the present time. Standard methods of analyzing cast iron now are in the course of completion.

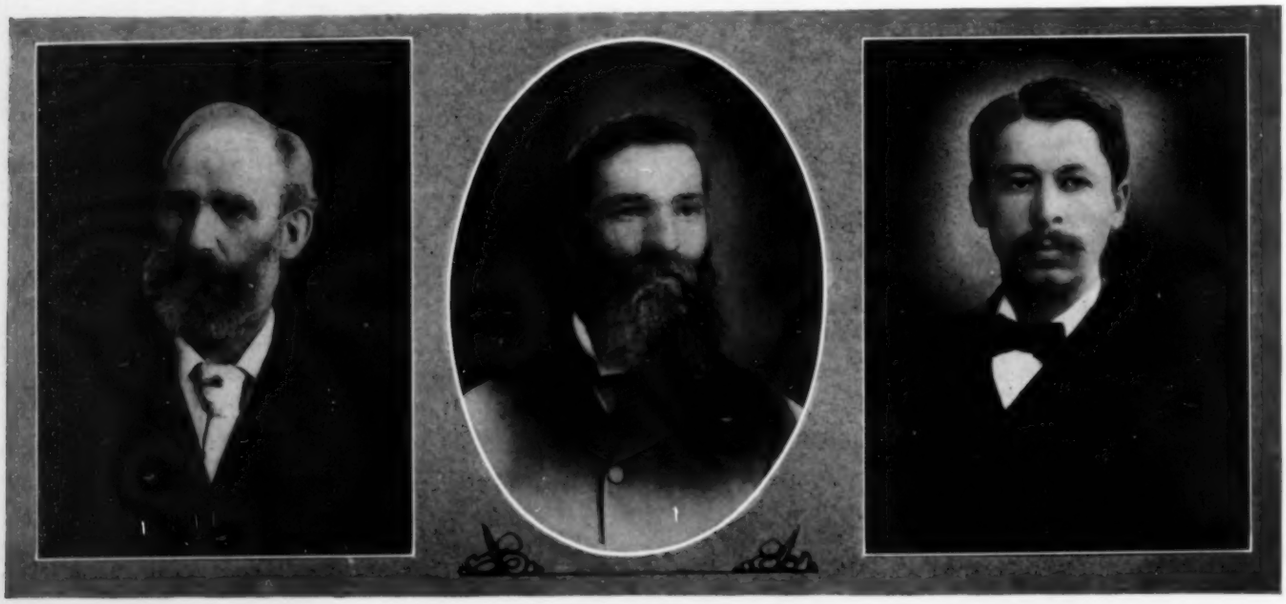
* * *

"Much work has been done on systems of apprenticeship, trade schools, cost systems, and instruction papers intended to help the foundryman educate younger workmen. In general, the work of the association has been directed toward awakening the great foundry industry to the need of more and better trained men to man the shops."

Thought Trend Changed

W. H. McFadden, Mackintosh, Hemphill & Co., Pittsburgh, who had been elected at the Cleveland convention in 1906, presided at the second Philadelphia meeting. Dr. Richard Moldenke was secretary at this time, C. J. Caley, John W. Burr, Stanley G. Flagg Jr., J. H. Whiting, W. J. Keep, J. P. Golden, Lawrence L. Anthes and T. W. Sheriffs all were vice presidents.

The program followed includes papers which give an interesting sidelight on the trend of thought in the association and the industry 12 years ago. The question of technical school training on foundry subjects was presented by five speakers. The design and construction of foundry buildings and the various departments therein were dealt with in five papers. The metallurgy of iron, steel and nonferrous castings was discussed by such men as William M. Saunders, Charles J. Caley, C. E. Johnson, James F. Webb, and H. E. Diller. The business side of the gray-iron, steel, and malleable foundry was discussed by



F. W. GIBBY JOSEPH BEST I. W. FRANK

Some foundrymen who were prominent figures in the early history of the association and left their influence on the growth of the national body

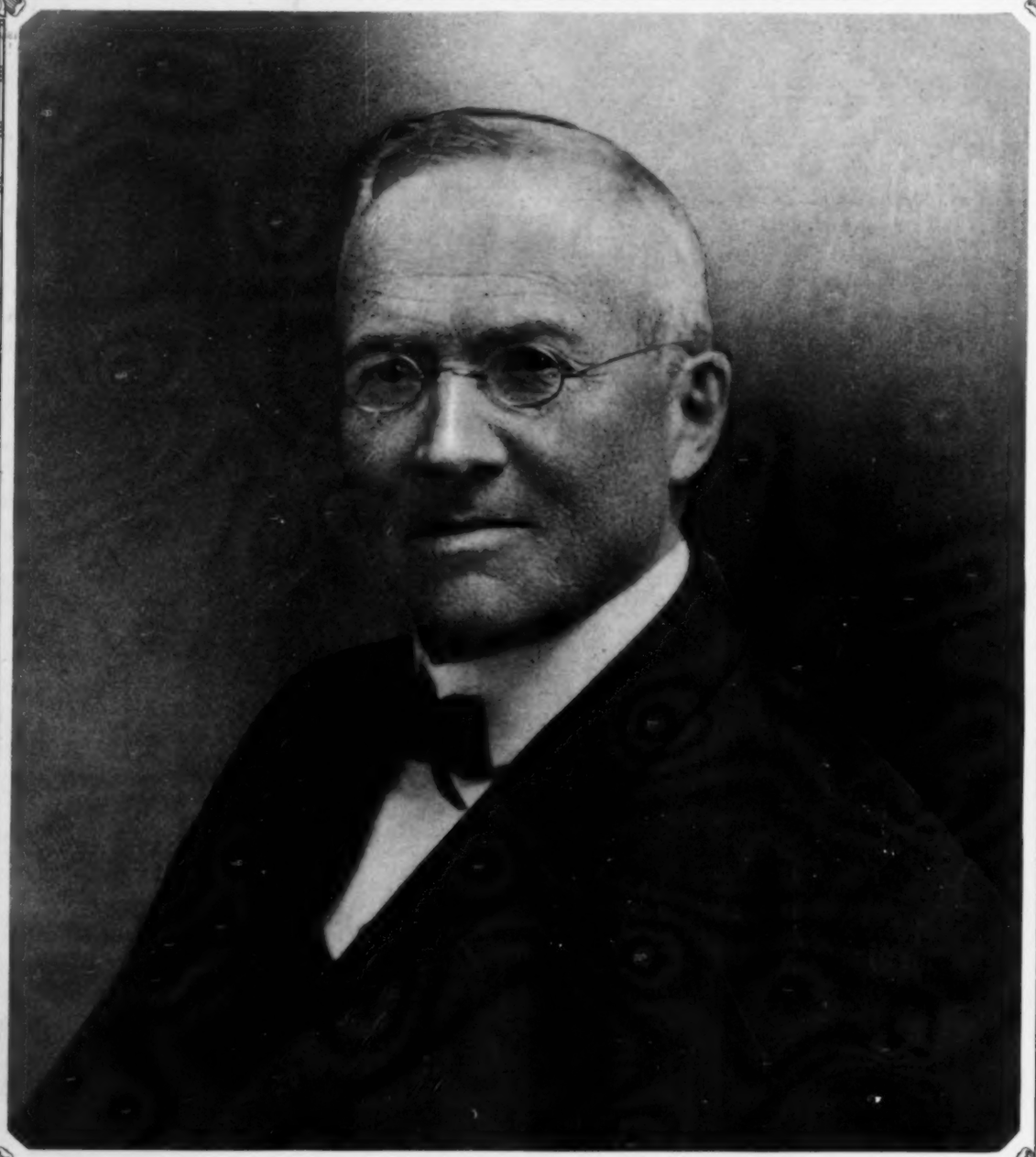
Those Who Attended First Convention

James T. Lanigahn, Davis Foundry Co., Lawrence, Mass.
James J. Lacy, James J. Lacy & Co., Baltimore.
Jacob Loomis, Elwood Iron Works, Elwood, Ind.
W. C. Lockhart, W. C. Scott Foundry, Reading, Pa.
H. M. Lane, Lane & Bodley Co., Cincinnati.
W. M. Laughlan, Pickands, Mather & Co., Cleveland.
F. P. Leonard, Dighton Furnace Co., Taunton, Mass.
J. H. Longstreet, Riverview Iron Works, Bordentown, N. J.
William W. Lobdell, Lobdell Car Wheel Works, Wilmington, Del.
T. S. Lewis, Waterbury Farrell Foundry & Machine Co., Waterbury, Conn.
E. J. Lane, R. D. Wood & Co., 400 Chestnut street, Philadelphia.
George C. Matlack, I. P. Morris Co., 1021 Richmond street, Philadelphia.
D. J. Matlack, I. P. Morris Co., 1021 Richmond street, Philadelphia.
J. S. McCormick, J. S. McCormick & Co., Pittsburgh.
E. McLean, Pennsylvania railroad, Altoona, Pa.
May De Courcy, Dickson Mfg. Co., Scranton, Pa.
W. J. W. Moore, Crane Iron Works, Philadelphia.
George Mesta, Leechburg Foundry & Machine Co., Pittsburgh.
Frank A. Magee, Magee Furnace Co., Boston.
C. M. Mott, Abram Cox Stove Co., Lansdale, Pa.
W. S. Mosher, Mosher Foundry & Mfg. Co., Dallas, Tex.
George L. Messick, Pusey & Jones Co., Wilmington, Del.
N. Mager Jr., A. & P. Roberts & Co., Pencoyd, Pa.
T. E. McDermott, Kavanagh & McDermott, Philadelphia.
George R. Michender, Philadelphia.
Louis J. McGrath, Devlin & Co., American and Lehigh avenue, Philadelphia.
F. C. Mosedale, Richards, Mather & Co., New Haven, Conn.
A. B. Moore, Samuel L. Moore & Sons Co., Elizabeth, N. J.
Henry Morris, Philadelphia.
John F. Mills, Abendroth Bros., Port Chester, N. Y.
Abram C. Mott, Abram Cox Stove Co., Philadelphia.
O. Miller, Westinghouse Air Brake Co., Pittsburgh.
Ernest E. Mann, American Radiator Co., Detroit.
H. B. Murless, Rockville, Conn.
H. J. McCartney, American Telephone & Telegraph Co., New York.
G. K. Mohr, J. J. Mohr, Philadelphia.
Alfred Marshall, Marshall Bros. & Co., Philadelphia.
E. M. Mumford, Elizabeth, N. J.
F. F. Moore, Monitor Iron Works, New York.
T. L. Morton, R. D. Wood & Co., Philadelphia.
F. M. Morris, Jeanesville Iron Works, Jeanesville, Pa.
John W. Neave, W. Pusey & Jones Co., Wilmington, Del.
Roberts I. Newkirk, William Wharton Jr. & Co., Philadelphia.
W. H. Nichols, P. R. R., Renova, Pa.
Edward P. Osgood, Osgood & Hart, Charlestown, Mass.
William Osborne, Du Bois Iron Works, Du Bois, Pa.
A. E. Outerbridge, William Sellers & Co., Inc., Philadelphia.
George Ormrod, Donaldson Iron Co., Emaus, Pa
John D. Ormrod, Donaldson Iron Co., Emaus, Pa.
John Paxson, J. W. Paxson & Co., Philadelphia.
C. L. Prince, Camden Iron Works, Camden, N. J.
Henry J. Pepper, "The Iron Age," 19 S. Fourth street, Philadelphia.
W. H. Pfahler, Abram Cox Stove Co., Philadelphia.
Edw. P. Osgood, Osgood & Hart, Charlestown,
J. M. Payne, Rogers, Brown & Warner, Bullitt building, Philadelphia.
Leonard Peckitt, Crane Iron Works, Catasaqua, Pa.
M. J. Perault, Fitchburg, Mass.
Henry C. Pickles, Wilmington Pipe & Foundry Co., Wilmington, Del.
J. M. Peterson, Vaul & Murdoch, Charleston, S. S.
E. B. Pierce, Wheeler Foundry Co., Worcester, Mass.
Thomas Pele, Bement, Miles & Co., Philadelphia.
George F. Pettinos, Pettinos Bros., Philadelphia.
C. E. Pettinos, Pettinos Bros., Bethlehem, Pa.
H. O. Patch, American Glutrose Works, Ninth and Chestnut streets, Philadelphia.
W. C. Pearse, American Glutrose Works, Ninth and Chestnut streets, Philadelphia.
William Peacock, Union Lock & Hardware Co., Lancaster, Pa.
Henry Potts, Pottstown, Pa.
A. J. Picard, Clinton Iron & Steel Co., Pittsburgh.
John A. Penton, "The Foundry," Detroit.
W. S. Rhoades, W. S. Rhoades & Co., Twenty-third and Master streets, Philadelphia.
George R. Rominger, Girard Iron Works, Twenty-third and Master streets, Philadelphia.
John Rohland, Coxe Iron Mfg. Co., Drifton, Pa.
Thomas I. Rankin, Abram Cox Stove Co., Philadelphia.
J. M. Ribert, Hubley Mfg. Co., Lancaster, Pa.
John O. Reed, Standard Mfg. Co., Pittsburgh.
Joseph B. Rorke, P. & R. Iron Foundry, Reading, Pa.
Edw. Robinson, Wells Light Mfg. Co., New York.
Godfrey G. Rebmann, Rebmann & Co., Philadelphia.
Fred A. Riehle, Riehle Bros., Ninth and Master streets, Philadelphia.
Harry G. Rebmann, G. Rebmann & Co., Philadelphia.
H. Ruhland, Girard Iron Works, Philadelphia.
Jos. Richards, Delaware Metal Refinery, Philadelphia.
H. R. Rea, Robinson & Rea Mfg. Co., Pittsburgh.
W. C. Robinson, Robinson & Rea Mfg. Co., Pittsburgh.
John R. Russel, Russel Wheel & Foundry Co., Detroit.
V. H. Rood, Jeanesville Iron Works, Jeanesville, Pa.
G. R. Rebmann, Morse, Williams & Co., Philadelphia.
W. T. Rainey, Harrison Bldg., Philadelphia.
A. C. Rex, A. C. Rex & Co., Frankford, Philadelphia.
Theodore C. Search, Philadelphia.
Francis Schumann, Tacony Iron & Metal Co., Tacony, Philadelphia.
Howard R. Shepard, Isaac A. Sheppard & Co., Philadelphia.
William F. Sauter, G. Rebmann & Co., Philadelphia.
W. W. Stevens, W. W. & R. S. Stevens, Ninth and Montgomery avenue, Philadelphia.
H. H. Stone, Pennsylvania railroad, Altoona, Pa.
A. Sorge Jr., 1533 Marquette Bldg., Chicago.
William H. Stein, Ticonderoga Mch. Co., Ticonderoga, N. Y.
A. G. Sutherland, K. V. Wire & Iron Works, Kansas City, Mo.
George P. Smyser, E. G. Smyser's Sons, York, Pa.
John Smith Jr., S. H. Hodge & Co., Detroit.
Curtis W. Shields, Ingersoll Sergeant Drill Co., Easton, Pa.
J. P. B. Sadtler, Baltimore Link Sash Weight & Fdy. Co., Baltimore.
Bartlett M. Shaw, Walker Pratt Mfg. Co., Boston.
James L. Steward, Armstrong Iron Works, Vineland, N. J.
S. D. Sleeth, Westinghouse Air Brake Co., Pittsburgh.
J. S. Seaman, Seaman Sleet & Black, Pittsburgh.
J. C. Sawyer, Somersworth Mch. Co., Dover, N. H.
John Speara, Columbia Gray Iron Co., Columbia, Pa.
George F. Stilbgen, Marietta Casting Co., Marietta, Pa.
James S. Stirling, Harlan & Hollingsworth Co., Wilmington, Del.
E. C. Saunier, Clinton Iron & Steel Co., New York.
Pemberton Smith, N. Y. Car Wheel Works, Buffalo.
F. B. Shaffer, Union Foundry Co., Elizabeth, N. J.
E. U. Scoville, Manlius, N. Y.
George B. Scoville, Waterbury, Conn.
Edw. A. Summer, American Radiator Co., Detroit.
Frank Schumann, Tacony Iron & Metal Co., Tacony, Philadelphia.
J. M. Sherrard, Taylor Iron & Steel Co., High Bridge, N. J.
W. H. Smith, Whitehead Bros. Co., New York.
Howard Stauffer, Columbia Gray Iron Co., Columbia, Pa.
J. A. Steinmetz, Jannery & Steinmetz, Drexel Bldg., Philadelphia.
James A. Smyser, E. G. Smyser's Sons, Baltimore.
Ross G. Smith, Medeira, Hill & Co., Philadelphia.
Charles P. Shoen, Shoen Mfg. Co., Pittsburgh.
M. F. Smearmann, Pennsylvania railroad, Altoona, Pa.
Josiah J. Thompson, Thompson & Co., Philadelphia.
Robert Taylor, Taylor, Wilson & Co., Pittsburgh.
Benjamin Talbot, Pencoyd, Pa.
C. A. Treat, C. A. Treat Mfg. Co., Hannibal, Mo.
C. L. Tittle, Blairsville, Pa.
D. Townsend, Philadelphia Roll & Mch. Works, Philadelphia.
R. J. Taylor, R. J. Taylor & Son, Philadelphia.
H. B. Taylor, Pettinos Bros., Philadelphia.
Robert Tolmie, Loddell Car Wheel Co., Wilmington, Del.
Walter B. Tyler, Southern Fdy. & Mach. Works, Fredericksburg, Va.
Clarence Taylor, Philadelphia.
H. R. Valentine, M. D. Valentine & Bro. Co., Woodbridge, N. J.
G. W. Van Tine, Singer Mfg. Co., Elizabeth, N. J.
Charles F. Voight, Sterling Metal Ref. Co., Philadelphia.
Walter R. D. Wood, Wood & Co., Philadelphia.
John S. Wilbraham, Wilbraham Baker Blower Co., Philadelphia.
John M. Warner, Rogers, Brown & Warner, Philadelphia.
Asa W. Whitney, S. Whitney & Sons, Philadelphia.
I. W. Winchester, Magee Furnace Co., Chelsea, Mass.
Thomas Wathey, United Verde Copper Co., Jerome, Ariz.
Thomas D. West, Sharpsville, Pa.
George Wiard, Wiard Plow Co., Batavia, N. Y.
A. J. Wittingham, Moore, Kelly & Co., Philadelphia.
J. P. Winlock, Barbour, Stockwell & Co., Cambridge, Mass.
Arthur W. Walker, Walker & Pratt Mfg. Co., Boston.
Jerome Weyhemmeyer, Jeanesville Iron Works, Jeanesville, Pa.
E. E. Weaver, Midvale Foundry Co., Allentown, Pa.
Andrew Wheeler, Morris, Wheeler & Co., Philadelphia.
V. L. Whitehead, Whitehead Bros. Co., Buffalo.
C. W. Whiting, Van Bergen & Co., Ltd., Carbondale, Pa.
William R. Webster, Philadelphia.
Harris Whittemore, Naugatuck Mall. Iron Co., Naugatuck, Conn.
Ames Walder, Genesee Foundry, Rochester, N. Y.
George R. Walker, J. Thompson & Co., Philadelphia.
R. M. Wortham, Keystone Brass Foundry, Philadelphia.
Thomas H. Williams, A. A. Griffing Iron Works, Jersey City, N. J.
W. W. Walker, Pusey & Jones Co., Wilmington, Del.
C. R. Wood, R. D. Wood & Co., Philadelphia.
A. D. Wilson, Gray's Ferry Fdy. & Brass Works, Philadelphia.
William Yagle, William Yagle & Co., Ltd., Pittsburgh.
M. B. Young, Philadelphia.

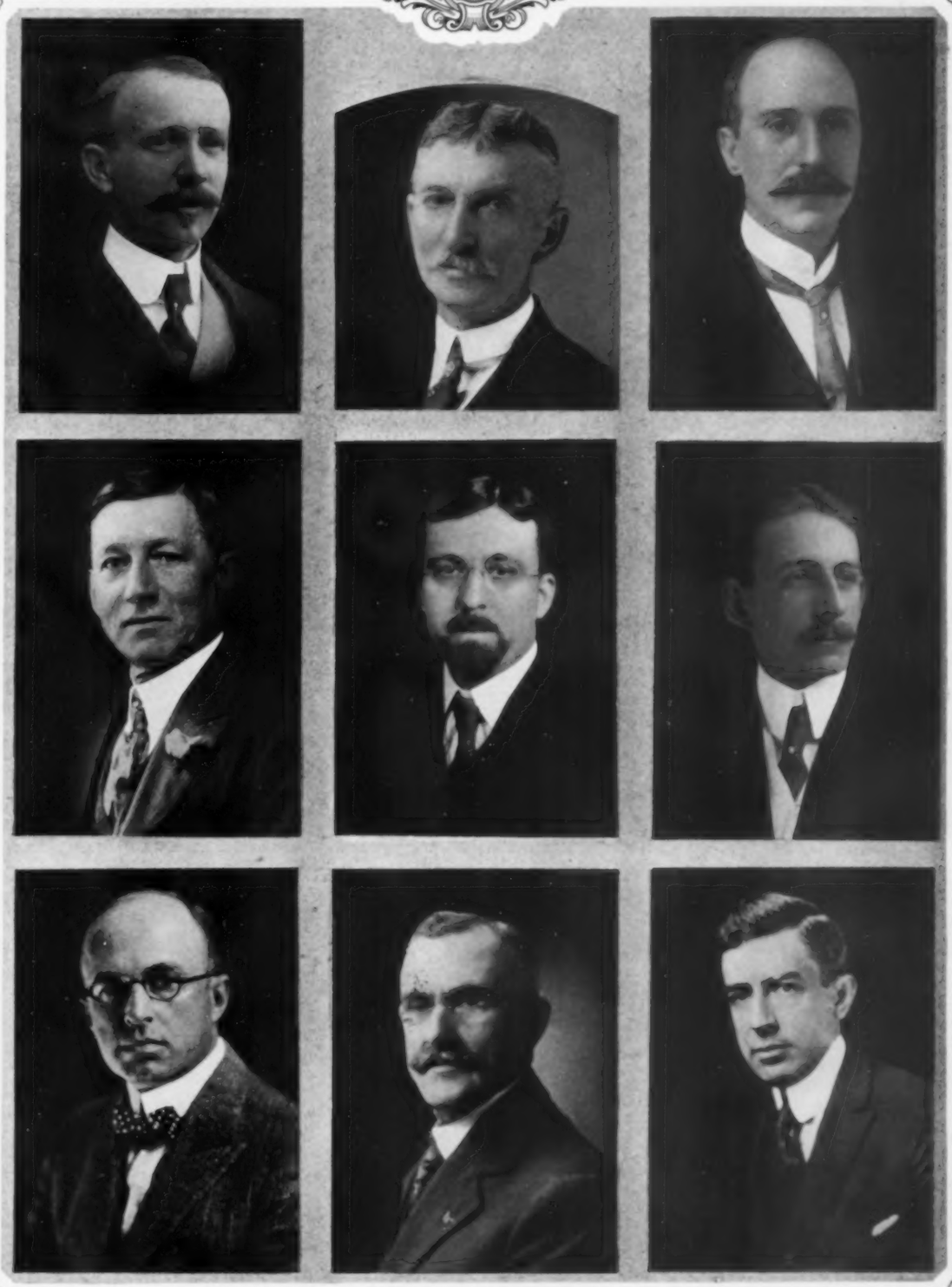
Thomas D. West, W. M. Carr and Dr. Richard Moldenke. respectively. Two papers which were presented gave indication of the growing international influence of the association. These were on a new method of preparing molding sand, and molding machines two subjects which were presented by E. Ronceray, Paris, France.

Practically every state in the union was represented among the 1391 registered visitors at the convention, and over 100 foundrymen from Canada were in attendance. Thomas Devlin, as president of the Philadelphia association welcomed the members of the association at the initial session. Howard Evans, who had been the first secretary of the Philadelphia body, still occupied the same office. Over 65 different manufacturers exhibited their products at the supply show which was conducted in connection with this convention.

Prominent Foundrymen of Philadelphia and Vicinity



THOMAS DEVLIN
President, Philadelphia Foundrymen's Association.



H. M. BOUGHER
Chairman, Clearing House Committee

G. F. PETTINOS
Chairman, Information Committee

C. R. SPARE
Chairman, Publicity Committee

HOWARD EVANS
Secretary, Philadelphia Foundrymen's Ass'n.

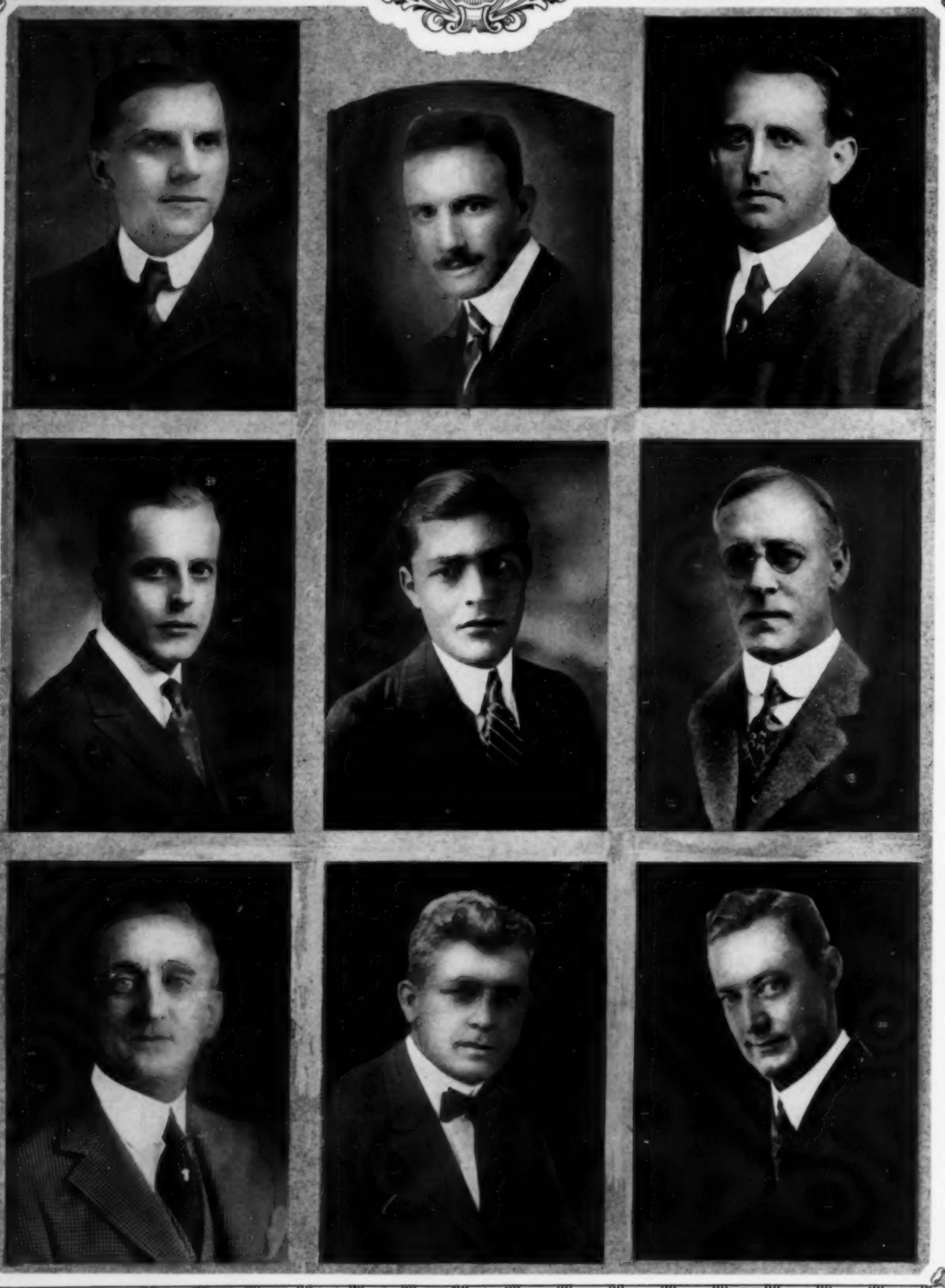
C. P. POND
Chairman, Finance Committee

W. J. SHENNAN
Bethlehem Steel Company

GEORGE C. DAVIES
Chairman, Visitation of Plants Committee

FRANK KRUG
Chairman, Entertainment Committee

F. J. RYAN
American Metallurgical Co., Philadelphia



H. F. REBMANN
American Engineering Co., Philadelphia

F. E. SCHWARZE
Cleveland Pneumatic Tool Co., Cleveland

THOMAS KAVENY
Herman Pneumatic Machine Co., Pittsburgh

W. G. SUMMERS
Phoenix Iron Co., Philadelphia

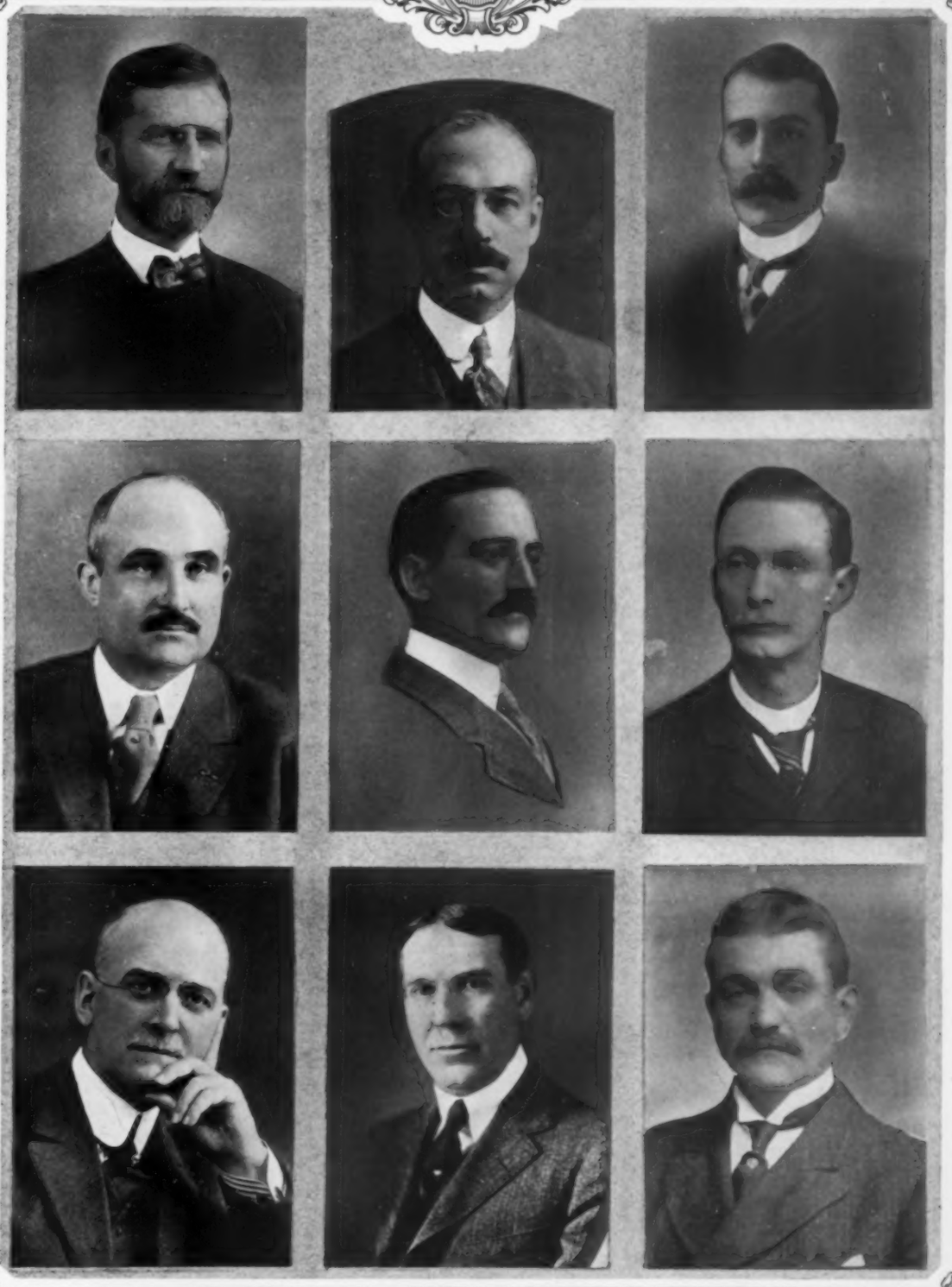
H. E. MANDEL
Lindsay Chaplet & Mfg. Co., Philadelphia

H. W. GLEDHILL
Shepard Electric Crane & Hoist Co.

G. R. SULLIVAN
Rogers, Brown & Co., Philadelphia

C. T. BIRD
Pangborn Corporation, Hagerstown, Md.

H. L. HENSZY
Carborundum Co., Philadelphia



T. E. EYNON
Eynon, Evans Co., Philadelphia

W. S. QUIGLEY
Quigley Furnace Specialty Co., New York

W. H. RIDGWAY
C. Ridgway & Sons Co., Coatesville, Pa.

A. G. WARREN
J. W. Paxson Co., Philadelphia

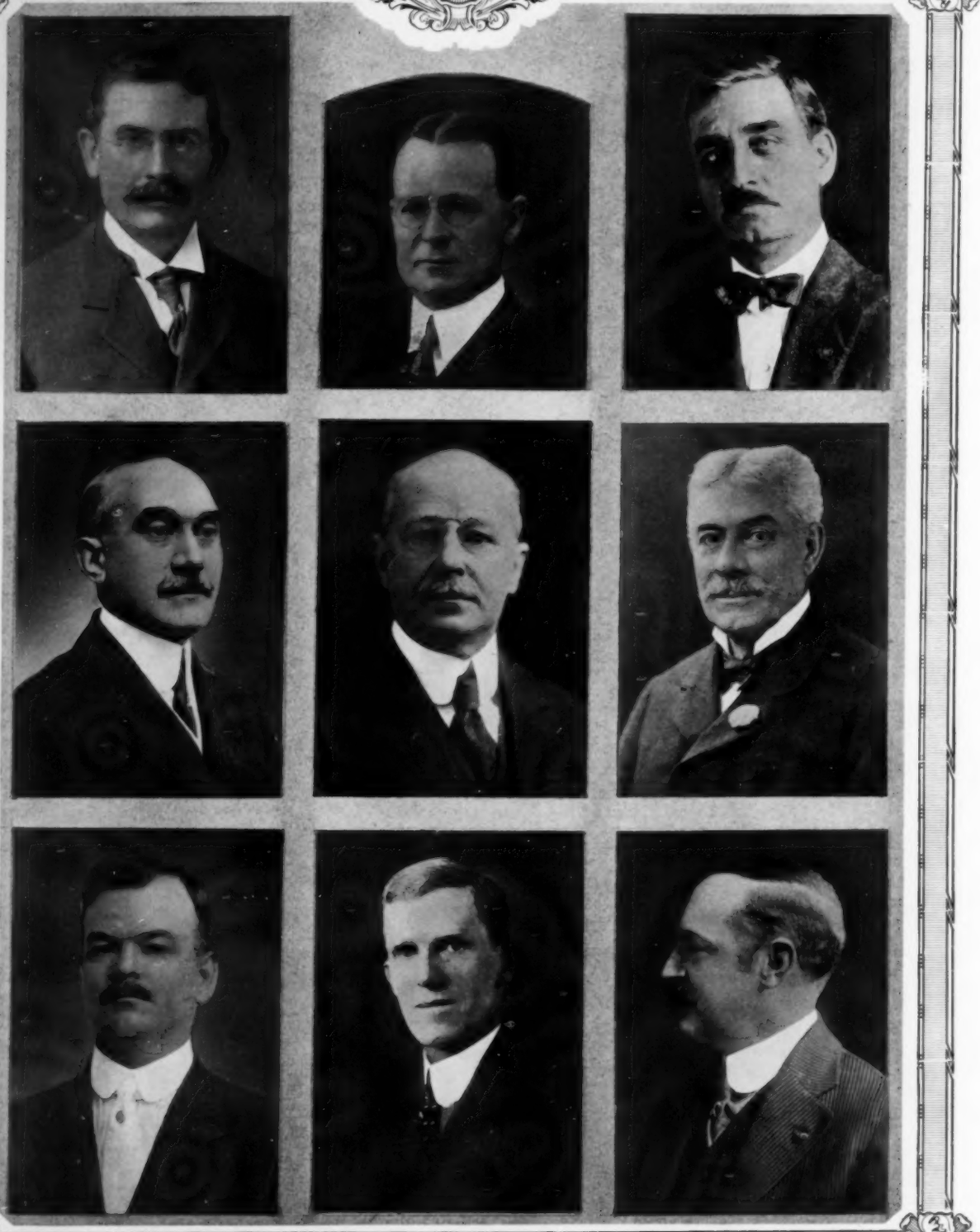
D. P. HOPKINS
U. S. Cast Iron Pipe & Foundry Co.

C. H. NEWCOMB
Crocker Bros., Philadelphia

GEORGE C. DAVIS
Chemist, Philadelphia

JOSIAH THOMPSON
J. Thompson & Co., Philadelphia

S. G. FLAGG Jr.
S. G. Flagg & Co., Stowe, Pa.



W. W. HEARNE
Matthew-Addy Co., Philadelphia

G. H. CLAMER
Ajax Metal Co., Philadelphia

S. J. BECK
Pusey & Jones Co., Wilmington, Del.

D. E. HADLEY
W. W. Sly Mfg. Co., New York

S. M. TOMLINSON
Frank Samuel, Philadelphia

J. S. STIRLING
Hilles Jones Co., Wilmington, Del.

W. J. JOHNSON
Baldwin Locomotive Works, Eddystone, Pa.

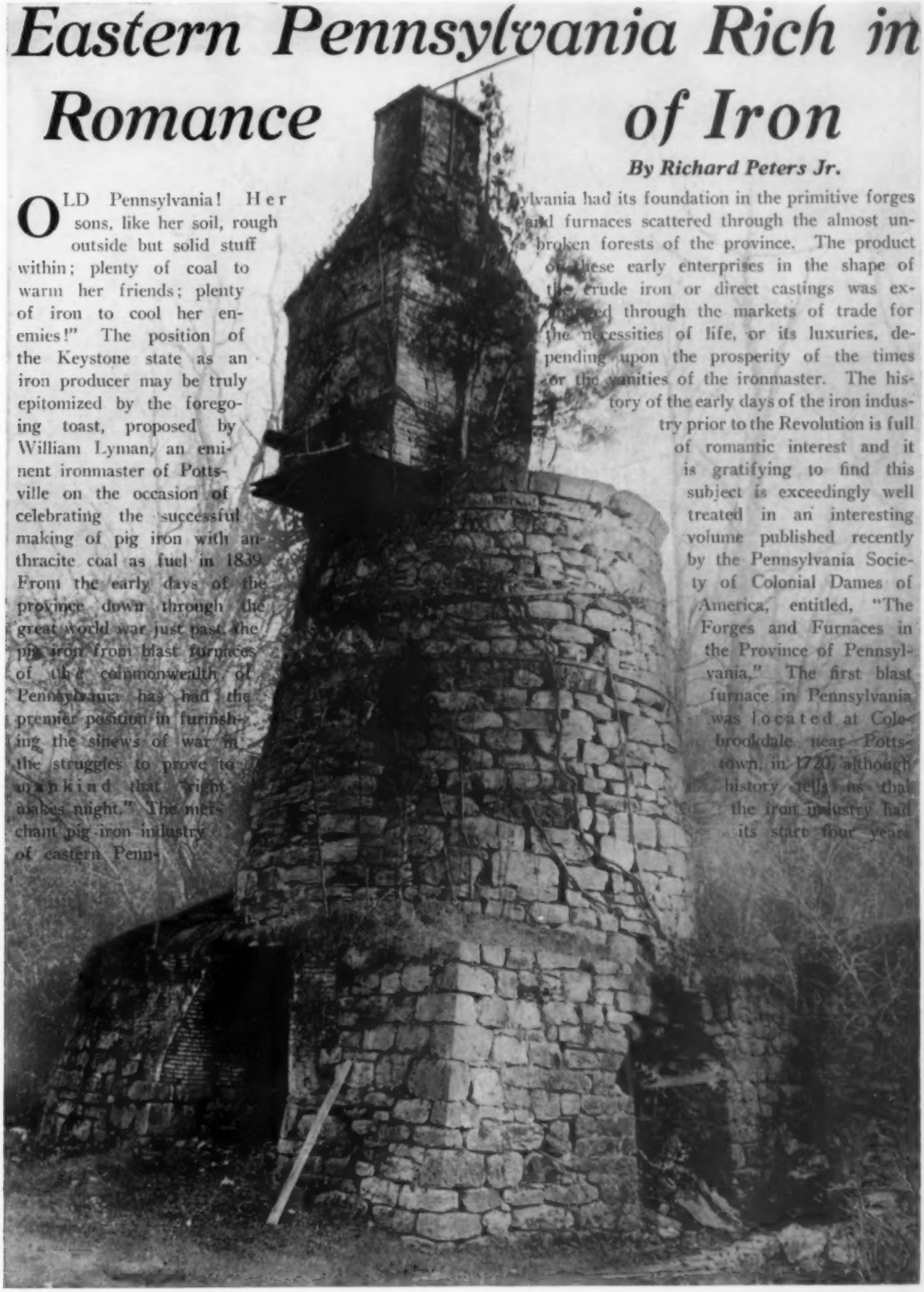
J. S. HIBBS
J. W. Paxson Co., Philadelphia

E. M. TAGGART
J. W. Paxson Co., Philadelphia

Eastern Pennsylvania Rich in Romance of Iron

By Richard Peters Jr.

OLD Pennsylvania! Her sons, like her soil, rough outside but solid stuff within; plenty of coal to warm her friends; plenty of iron to cool her enemies!" The position of the Keystone state as an iron producer may be truly epitomized by the foregoing toast, proposed by William Lyman, an eminent ironmaster of Pottsville on the occasion of celebrating the successful making of pig iron with anthracite coal as fuel in 1839. From the early days of the province down through the great world war just past, the pig iron from blast furnaces of the commonwealth of Pennsylvania has had the premier position in furnishing the sinews of war in the struggles to prove to mankind that "right makes might." The merchant pig-iron industry of eastern Pennsylvania had its foundation in the primitive forges and furnaces scattered through the almost unbroken forests of the province. The product of these early enterprises in the shape of the crude iron or direct castings was exploited through the markets of trade for the necessities of life, or its luxuries, depending upon the prosperity of the times or the vanities of the ironmaster. The history of the early days of the iron industry prior to the Revolution is full of romantic interest and it is gratifying to find this subject is exceedingly well treated in an interesting volume published recently by the Pennsylvania Society of Colonial Dames of America, entitled, "The Forges and Furnaces in the Province of Pennsylvania." The first blast furnace in Pennsylvania was located at Colebrookdale near Pottstown, in 1720, although history tells us that the iron industry had its start four years



RUINS OF CODORUS FURNACE IN YORK COUNTY, PA., STILL STANDING. NOTE THE HOT BLAST OVEN BUILT ON TOP OF THE STONE STACK, TYPICAL CONSTRUCTION BEFORE CIVIL WAR

CRANE IRON WORKS AT CATASAUQUA, PA., AS IT APPEARED IN 1852. THIS WAS ONE OF THE LARGEST OF THE PIONEER PLANTS IN AMERICA

previous by the erection of the Manatawny Forge.

The early furnaces were built of stone in the shape of a truncated pyramid, and lined usually with sandstone. These primitive stacks ranged from 20 to 40 feet in height and were located by a hillside to afford an easy method of charging the raw materials. The ore was supplied from nearby banks where the richer material was picked out, while the neighboring forests yielded wood for the charcoal. These furnaces were operated with cold blast blown through one tuyere with huge bellows or wooden tubs, the power being generated by a water wheel. The tops were open and at night the countryside was lighted up by the flames which, like a mythical oriflamme, rose and fell with the pulsations of the blast.

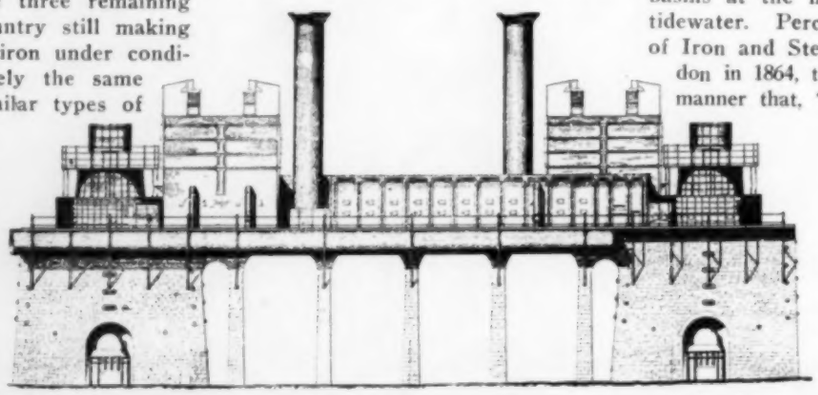
Five or six tons of iron a day was a good output, and the product was usually conveyed in wagons through the country to market, or floated on barges down some nearby stream. The ruins of a number of these ancient stacks are still scattered in remote spots through the state, but it is interesting to note that at Curtin and Milesburg in the Bald Eagle valley are two of the three remaining furnaces in this country still making cold blast charcoal iron under conditions almost precisely the same as did those of similar types of 125 years ago. The early iron industry of the state developed rapidly through the southeastern section in the territory which now comprises Cumberland, Berks, Bucks, Chester, Lancaster and Montgomery counties. During its advancing stages many of the early operators augmented their plants by adding puddle and rolling mills to refine and work up the metal for the trade.

These industries flourished in the more favored localities until the advent of steel brought about competition which they could no longer meet, resulting in the abandonment of a large majority of the plants. There were iron manufacturers also who were content to allow others to convert the crude pig metal to the uses of the trade, and whose plants were so located as to combat the effects of changing conditions. By keeping abreast of developments in the smelting process, and by taking advantage of their natural location in regard to source of supply of materials and the market, these more favored works became the forerunners of the merchant furnace plants of today.

As an example, attention is called to the furnace of the Robesonia Iron Co., at Robesonia, whose beginning dates back from 1793. This stack when originally built was known as the Reading furnace and, although the enterprise changed hands several times, there always has been a pig iron producer on the site. Robesonia furnace, which draws its main source of ore supply from the famous Cornwall deposits, enjoys a unique mineral right which has stood the test of years of litigation and still operates. This grant provided that the owners should have sufficient ore to operate one furnace "as long as grass grows and water runs." A thoroughly modern plant now occupies the site at Robesonia in place of the crude stone stack built 125 years ago in a clearing in the Lebanon valley.

After the invention of the hot blast in 1828, the next era of development was brought about by the use of anthracite coal as a fuel in the blast furnace. Ironmakers in many localities tried the experiment of replacing the charcoal fuel with anthracite, but it remained for William Lyman to have the honor of operating successfully the Pioneer furnace at Pottsville for a period of three months in 1839. A view of this plant at a somewhat later date appears with this article.

It was natural that the valleys of the Lehigh, Schuylkill and lower Susquehanna rivers should quickly respond to the development of the anthracite iron industry, with the building of canals from the coal basins at the heads of the rivers to tidewater. Percy, in his "Metallurgy of Iron and Steel," published in London in 1864, tells us in a picturesque manner that, "the principal manufacture (in America) must always cling to the Lehigh, Schuylkill and lower Susquehanna valleys in Pennsylvania where the ore is abundant, the coal near at hand and the flux on the spot; where the whole land is a

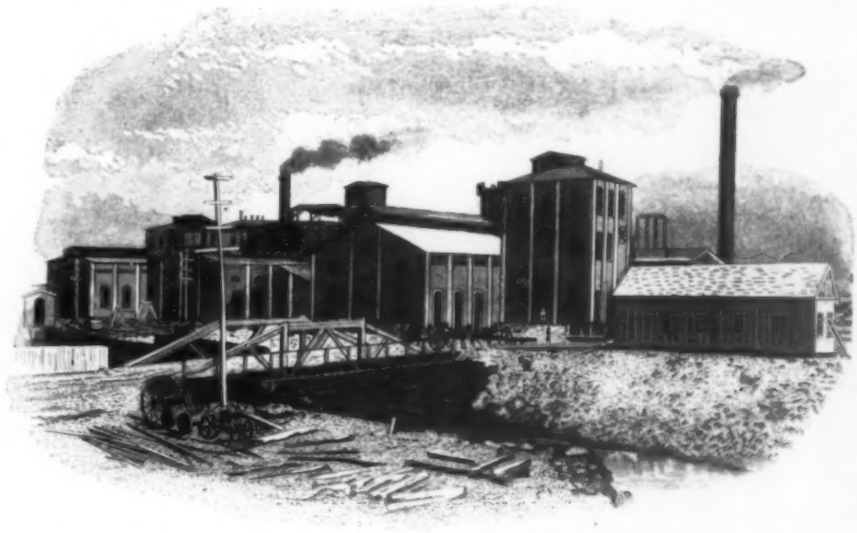


ELEVATION OF THOMAS IRON CO.'S PLANT AT HOKENDAUQUA, PA., IN 1865. THIS DRAWING SHOWS THE TYPICAL CONSTRUCTION OF EARLY LEHIGH VALLEY ANTHRACITE FURNACES

garden and, therefore, food cheap and labor plentiful and the great seaports not far off."

Indeed, there was a period when there could be counted along the banks of the Lehigh river what was equivalent to a furnace for every mile of the distance between Mauch Chunk and Easton.

Mr. Percy described the furnace plant of the Thomas Iron Co., at Hokendauqua. An elevation plan of this plant is reproduced from the book quoted, because it represents the typical construction of the anthracite furnaces as they were built in the fifties. The hot blast ovens and the boilers were erected on huge masonry arches, it being apparent that the early engineers felt there would be a greater saving of gas by having these accessories as close to the tunnel head as possible. There still stands one of the arches of the old Coleraine furnace along the Lehigh river between Bethelehem and Easton. Professor Lesley in his treatise "American Iron Manufacture," published in 1859, gives a poetical description of one of the old Lehigh valley plants, now long since torn down:



PIONEER FURNACES AT POTTSVILLE, PA., FROM AN ENGRAVING MADE ABOUT 1875. AT THIS PLANT PIG IRON WAS MADE SUCCESSFULLY BY THE USE OF ANTHRACITE IN 1839

"The Allentown anthracite steam furnaces rise together from the river plane in the grandest and most picturesque style, throwing into shade many of the castles of Europe. No finer object of art invites the artist. The still higher pile of the Crane works on the opposite side of the river a little higher up, is rendered less striking by the vicinity of the hills. The Allentown works rise undisturbed and unrivaled by surrounding heights, a world of stone and iron in the air, its summits crowned with tall chimneys like the turrets of Caernarvon, flames issuing from its tunnel heads, and cars traveling up and down its planes, long trains of ore mules passing to and fro across its lofty bridges, while other trains of railroad cars wait below to carry off its iron. The repose of bygone centuries seems to sit upon its immense walls, while the roaring energy of the present day fills it with a truer and better life than the revelry of Kenilworth or the chivalry of Heidelberg. Its archways conceal a perfected alchemy where the spirit of the wind converts earth to iron and dross to gold, condensing around this pile of matter a little world of intellectual and moral happiness and energy to which poets and statesmen might profitably travel to learn more than is read in books or declaimed in congress."

Doubtless the sublime utterances of the good professor may sound ludicrous to our more prosaic way of looking at these things, but to somewhat appreciate Lesley's descriptions, one only has to refer to the illustrations of the Allentown, Crane and Thomas plants, reproduced from old ambrotypes in Henry's "History of the Lehigh Valley."

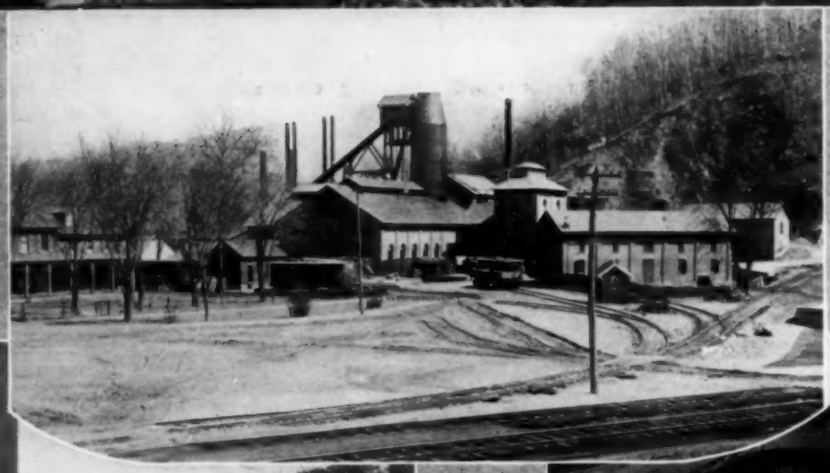
While Mr. Lyman had successfully made iron with anthracite as fuel at the Pioneer furnace at Pottsville, it remained for the present two leading merchant iron industries of the Lehigh valley to establish works which have continued operating ever since. In 1837, David Thomas at the Yniscedwyn furnace in Wales, commercially solved the problem of smelting iron with anthracite by utilizing the hot blast invented by Neilson 10 years previous. The news of this successful venture having reached this country, arrangements were made by the Lehigh Coal & Navigation Co., whose mines and waterways needed development, to send Erskine Hazard of their company to Europe to engage Mr. Thomas to come to America.

George Crane was a part owner of the Yniscedwyn works and when the first organization of the new enterprise was effected it was determined that Mr. Crane should be honored by having the company bear his name. Accordingly the Lehigh-Crane Iron Co. was organized and David Thomas was engaged to come to this country to establish a furnace on the Lehigh river. Mr. Thomas arrived with his family in the early summer of 1839 and immediately started to lay out the first furnace at Catasauqua. His son, the late Samuel Thomas, described the building of this plant and its subsequent starting in an interesting monograph published some 20 years ago.

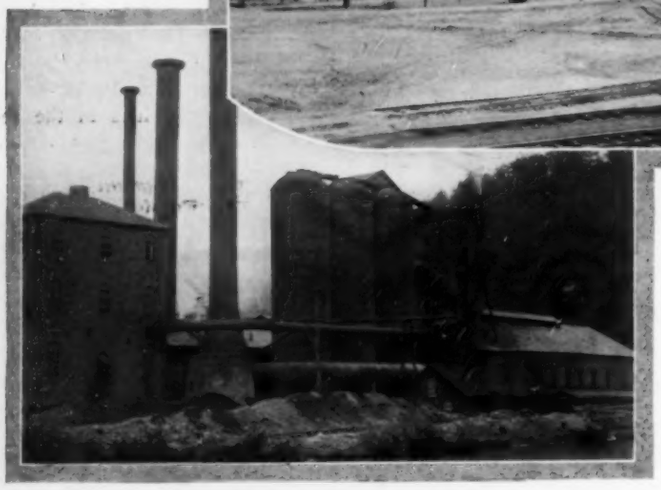
On July 4, 1840, the first cast of iron was made at Catasauqua, and from that day to the present Crane iron has always been on the market. From the small furnace originally built the plant grew until at one time it had five stacks on the banks of the Lehigh canal. Changes and improvements in the ensuing years reduced the units to only two, although the production was inversely increased. At present the plant is again being modernized by an addition of a skip hoist with other labor-saving devices. Leonard Peckitt, president of the Empire Steel & Iron Co., which operates the Crane Iron Works, has been its leading spirit for many years. Mr. Peckitt's activities in the recent war as a member of the committee on distribution of pig iron will long be remembered by the foundry trade and the eastern furnace operators, as he had the entire responsibility of allocating pig iron in that district under the direction of the war industries board. The Empire company in addition to owning the Crane works, operates the Topton and Macungie furnaces, and also has a modern plant at Oxford, N. J., in which district are located the principal ore mines of the company.

David Thomas was known as "the father of the American anthracite iron industry," and after he had successfully started the Crane works, he joined with 25 other enterprising citizens of the Lehigh valley in the formation of the Thomas Iron Co., in February, 1854. The first two furnaces were built at Hokendauqua and were put in operation in June and October, 1855. Later four other stacks were added, and subsequently the company absorbed the Lock Ridge Iron Co., operating two furnaces at Alburtis, the Keystone furnace at Island Park near Easton, and the Sau-

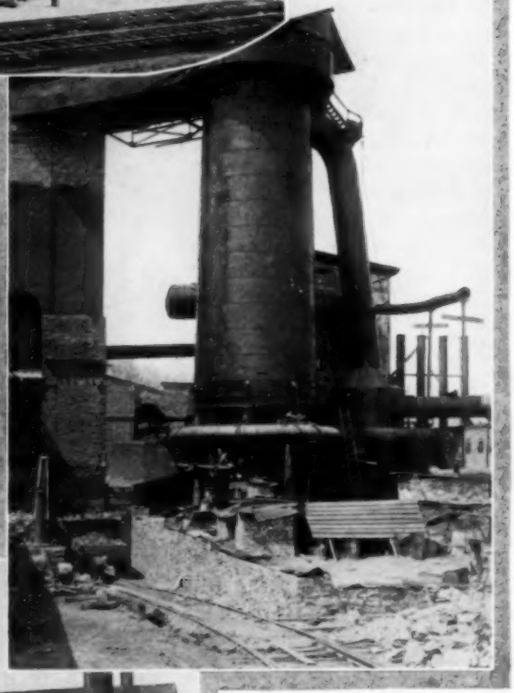
AT the right, Chickies furnace No. 1, built in 1845, remodeled in 1887, and last active in 1900



ABOVE, one of the stacks of the Glendon Iron Co., on the Lehigh river, near Easton, Pa., in 1881



CARBON furnace at Parryville, Pa., one of the early Lehigh valley plants, still operating



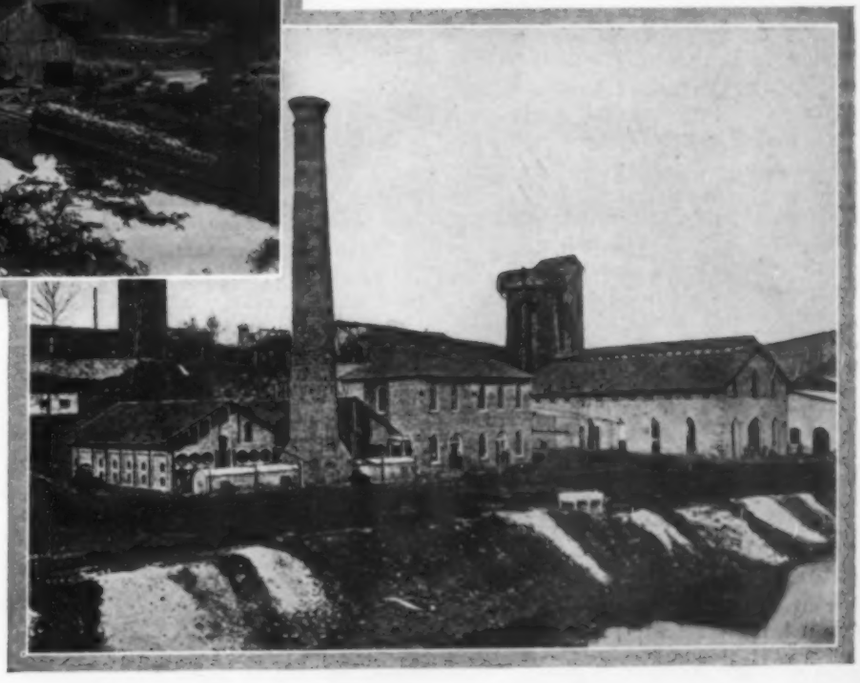
NO. 1 furnace of the old Warwick Iron Co., Pottstown, Pa., predecessor of the modern plant now operated by Eastern Steel Co.

NO. 1 Swede furnace, built in 1850 and rebuilt in 1897, showing old brick hoist tower since demolished. The furnace was again rebuilt in 1905, and is now producing foundry iron

ORIGINAL plant of Glendon Iron Co., near Easton, Pa., as it appeared about 1870. Note the blowing engine house between furnaces

ABOVE, Pine Grove furnace in Cumberland county, Pa., built in 1771, remodeled in 1877, and dismantled in 1902. In 1877, when the photograph was taken, the furnace was one of the most modern charcoal iron plants

DURHAM furnace, built by Cooper & Hewitt in 1874-1875 on a site where iron had been manufactured since 1727



HECLA furnace at Milesburg, Pa., built in 1864. It still is in operation, making cold-blast charcoal iron

con Iron Co., located at Hellertown.

At the plant of the Saucon Iron Co. was erected probably one of the first of the furnaces in this country to be built with an iron shell on cast columns. The original plan of the Hokendauqua plant was completely modified, and in place of the six stone stacks originally erected there were two modern skip-filled ones. Dr. B. F. Fackenthal, of Rieglesville, who is prominent in historical research regarding the early iron industry, wrote an interesting history of the Thomas Iron Co. on the fiftieth anniversary of the organization of the company, of which he was president at the time. The Keystone furnace recently was acquired by the Northern Ore Co., and is being repaired for further operation.

In commenting on the Thomas works, Mr. Lesley in 1857 said:

"The No. 1 furnace made 9731¼ tons while the No. 2 furnace produced 8366¾ tons. The consumate skill of long experience of the manager must no doubt avoid or redress the ordinary troubles of the process, but this immense production even from these first-class stacks can be accounted for only by the enormous consumption of oxygen which they are allowed. In a word, here stands the demonstration that a large and well built crucible properly stocked with good ores and properly blown with power to spare, must be a great and continual success."

At this point, may be mentioned an interesting incident connected with the eastern Pennsylvania iron market of 1879 which had started early in that year around $16 per ton. There was a sudden demand for pig iron which could not be met and the price was forced up steadily to $43. The owners of one ironmaking enterprise having seen that the high prices in this country were resulting in a large tonnage of scrap being imported from abroad, decided that they would forestall further movements by making a liberal cut in the price of their pig iron. Accordingly they notified all their trade that immediately the price of their iron would be reduced $10 a ton. This startling announcement from such a producer had the effect of immediately stopping all buying. The market fell more rapidly than it had advanced and it did not reach an equilibrium until the price was around $22. Not many years later the company liquidated and dismantled its plant at Glendon, which had consisted of five furnaces.

At Parryville, just above the picturesque gap where the Lehigh river breaks through Blue mountain, is located the Carbon furnace. Built in 1869, it is the survivor of a plant of three stacks which at one time were connected with a pipe foundry, and after several changes in ownership now is operated by the Carbon Furnace Co. This furnace is stocked by probably one of the last of the water hoists, its working dependent upon the alternate filling and emptying of a square tank forming the bottom of the cage. This unique arrangement is quite automatic and operates with little or no cost, as the water is under pressure from the surrounding hills.

Establish More Furnaces

In the lower Susquehanna valley the successful use of anthracite as fuel caused a number of furnaces to be built, particularly in Lancaster county. Of the several works established, the Chickies stacks were probably of greatest interest, as their career extended from 1845 to 1900. The original one of these furnaces, called "Chikiswalungo," was erected by Henry Haldeman in 1845, and for over 47 years it was never out of blast for more than six months at a time, which included the entire rebuilding of the plant at one period. During all the time the Chickies furnaces were in blast they were operated by the family of Horace L. Haldeman, now the president of the Pulaski Iron Co. The latter has in his possession interesting notes and records of the operations of the company. General Haldeman, while now guiding the destinies of this prominent Virginia interest, directs it from Philadelphia, and may well be claimed by the eastern Pennsylvania iron trade as one of its own. His active connection with the old Chickies plant for many years, and his association with the Pennsylvania iron men of his day, have made him a prominent figure in the pig iron fraternity. He is one of the few men living who operated furnaces through the radically changing conditions of the pig iron business and is still active today.

Vesta furnace at Marietta was built in 1868, and after passing through several changes in ownership was abandoned in 1903, to be revived and rebuilt in 1917 by the Lavino Furnace Co., which used it to manufacture ferromanganese.

Lebanon has always been an iron center, due to its close proximity to the Cornwall ore banks. The original Cornwall furnace was built in 1742 and is still preserved as a relic. The Coleman and Grubb families were prominent in the establishment of iron works in this district and operated the Bird Coleman, Colebrook, North Cornwall and North Lebanon furnaces. At the present time all the various plants in the Cornwall district, with one exception, have passed into the hands of the Bethlehem Steel Co. and are used by this corporation for supplying its customers with foundry iron.

In the Schuylkill valley the Warwick plant has had the most interesting history. Originally built in 1737 some 10 miles from Pottstown, the old Warwick furnace was actively engaged in casting cannon for the Revolution and for many years was an important industry. In 1875 the first furnace of the present plant was built but not on the same site and by other interests who recognized the fame of the older enterprise. Through the energies of the late Edgar S. Cook the Warwick furnace rapidly took a foremost place in the industry and many important experiments were made at that plant. In 1900 Mr. Cook erected the first 100-foot furnace in the East, which commanded the keenest attention of the iron men at the time. The present plant at Pottstown consists of two modern furnaces, and while they are controlled by the Eastern Steel Co., they belong to the foundry iron producing class, in that much of their product still finds its way to local markets.

Further up the Schuylkill river at Birdsboro is the furnace of the E. & G. Brooke Iron Co., the operations of which have been guided by the Brooke family for several generations. The present plant has succeeded three old stacks built in the seventies which had a total output of only one-half

Prize Photographs of Old Iron Works

THIS comprehensive and authoritative account of the development of the merchant iron industry of eastern Pennsylvania is illustrated with some of the oldest and most treasured photographs in the possession of those whose interests have been identified with the industry. The photographs were obtained from the collections of Horace L. Haldeman, president, Pulaski Iron Co., Philadelphia; Harry Firmstone, Longdale, Va.; Birkinbine Engineering Offices; Frank C. Roberts & Co.; B. F. Fackenthal Jr.; Robert C. Lea & Co.; H. F. Hallman; J. S. Stillman, of the Empire Steel & Iron Co.; J. E. Rotthaus, of the Thomas Iron Co. and the author of the article.

LEONARD PECKITT, president, Empire Steel & Iron Co., who served as eastern representative on pig iron during war

JOSEPH E. THROPP, Pennsylvania's only surviving iron master

HORACE L. HALDEMAN, of an historic family of Pennsylvania ironmasters, now president of Pulaski Iron Co.

B F. FACKENTHAL JR., who as president guided the Thomas Iron Co.'s development for two decades

EDGAR S. COOK, who built the first 100-foot stack in the East. Mr. Cook died in 1917

DAVID THOMAS, known as the founder of the American anthracite iron industry and who, as a practical iron man, started the Crane Iron Works and Thomas Iron Co. He was born at Tyllwyd, South Wales, Eng., Nov. 3, 1794, and died June 20, 1882

of what the modern Brooke furnace produces today.

Pottsville, Reading, Leesport, Norristown and other towns along the Schuylkill have had their vicissitudes in the iron trade, and the older men in the business may still recall the brand names of Annville, Edgehill, Henry Clay, Merion, Monocacy, Moselum, Pioneer, Plymouth, Lucinda and William Penn, all of which have been out of the market for many years. The Reading Iron Co. operates the Keystone furnace at Reading and also the plant at Emaus.

At Swedeland, a few miles above Philadelphia, are the Swede furnaces, formerly operated by the Philadelphia & Reading Coal & Iron Co., which corporation at one period was active in manufacturing pig iron. Professor Lesley in his work previously quoted says:

"The Swede Iron Co. Nos. 1 and 2, form a noble pile visible from afar on the plane of the right bank of the Schuylkill. The double stack with its lofty round arches is as fine a study in its way for artists as the Allentown stacks, gaining in effective height what it lacks in width and mass."

These furnaces were later operated by the Richard Heckscher & Sons Co., but no part exists today of these old works. They have been completely replaced by a thoroughly modern plant of three furnaces served with by-product coke ovens, and are operated as an adjunct to the plant of the Alan Wood Iron & Steel Co., across the river, with which they are connected by a convenient hot-metal bridge.

Figured in Revolution

For many years the Durham furnace at Riegelsville in Bucks county enjoyed the distinction of being the most easterly plant in the state. A furnace stood there from 1727 to 1912, and much of interest can be written of the history of the Durham plant. The Durham flat boats, used for transporting the pig metal in the olden days, figured in Washington's historic crossing of the Delaware. Dr. Fackenthal, who resides near the site of the old Durham works, has made a study of old stove plates cast at the early Pennsylvania furnaces, and has been able in many cases to locate the possible place of manufacture of these castings by careful analysis of the iron from which they were made. From his knowledge of the peculiarity of the analysis of the ores which were in the neighborhood of the old furnaces, he could determine the character of iron that was produced, and hence could check the probable origin of the stove plate castings.

With the passing of Durham and the demolishing in 1890 of the blast furnace that was built in the Kensington district of Philadelphia in 1873, the plant at Chester became the only furnace on the Delaware river. Originally built in 1880 as an adjunct to the Chester Rolling Mills, it was in its day the most modern of all the eastern Pennsylvania furnaces, and had the distinction of being one of the first to produce what is now known as low phosphorus iron. The writer's father, long connected with this plant, is authority for the interesting information that at these mills were rolled plates for the first American steel squadron, the ATLANTA, BOSTON, CHICAGO and DOLPHIN, the steel being made partly from iron produced at the local furnace. The late S. T. Wellman developed at this plant his inventions which have resulted in great saving in the cost of producing steel. The rolling mills long since have passed into history but the original furnace plant with a few modern additions still produces pig iron and has been operated by the Delaware River Steel Co. for the past decade.

In the eastern slopes of the Alleghenies are a number of furnace plants the output from which finds its way to the eastern foundry markets. The most important in this district is operated individually by Joseph Earlston Thropp, whose position in the trade is unique, in that he is today the only actual ironmaster of the state. Mr. Thropp has extensive coal and iron holdings in Bedford county, having acquired some years ago the idle plants of the Saxton Furnace Co., at Saxton, and the Everett Iron Co., at Everett, both of which he completely remodeled. Mr. Thropp gained his early practical experience in the seventies at J. B. Morehead's works in the Schuylkill valley, and later operated the Edge Hill furnace as lessee. At Riddlesburg, also in Bedford county, the Colonial Iron Co. has a thoroughly modern furnace erected on the site of the two stone stacks built in 1869 and 1870 by the Kemble Coal & Iron Co. The Emporium furnace in Cameron county was built in 1888 by the Cameron Iron & Coal Co., and passed through several ownerships before it was leased by A. Brady and operated as the Emporium Iron Co. The Bellefonte and Nittany furnaces, built in 1887 in Center county, had checkered careers and were abandoned and dismantled a few years ago.

During the decade from 1870 to 1880 occurred important changes in the construction of furnace plants in eastern Pennsylvania as elsewhere. The stone stack with the iron extension afterwards added to increase the height, gave way to the steel or iron shell supported on cast columns. The iron hot blast oven began to find its nemesis in the advent of the Whitwell and Cowper regenerative stoves, which were introduced in 1877. Dunbar furnace in western Pennsylvania was the first stack in the state to be thus equipped, and the Crane works in the Lehigh district followed shortly after. The ironmasters of the day had heated discussions of the merits of the new type of stoves as compared with the older method of heating the blast, but in the end, as well known, the regenerative stoves won out. Nevertheless, several furnaces in the Lehigh region still are operating iron pipe stoves.

In this same period, chemists were first employed at the eastern blast furnaces. B. F. Fackenthal Jr., then operating Durham furnace, took a special course in chemistry at Lafayette college, while about the same time Edgar S. Cook installed a laboratory at the Warwick furnace at Pottstown. From 1880 and through the present century there appeared many further changes in the types of construction. The stone cast-houses fashioned with great care, gradually gave way to those of light steel construction, and the broad inclined planes and wooden hoist towers were replaced with steel elevators or skipways. Later pig-casting machines, gas washers, improved boilers, more powerful blowing equipment and pumps were added, so that today there is little in common between the present blast furnace and its predecessor.

Engineers Superintend Remodeling

As the plants grew and rebuilding became more involved, trained engineers were called into consultation to redesign and superintend the remodeling. John Hartman, of Philadelphia, was one of the older engineers of this type. Frank C. Roberts, also of Philadelphia, was probably one of the first men to specialize in blast furnace construction, acting in a consulting capacity and also as a contractor.

While the development of the pig iron industry in Virginia is hardly germane to this article, yet it is interesting to follow the Pennsylvania iron men who directed their further energies in the Old Dominion state. The Firmstones, after their successes at Glendon, joined the Pardees in building Longdale, while over the mountain on the James river, Wilton

MODERN furnace of Colonial Iron Co., Riddlesburg, Pa., erected in 1911 on site of stone stacks built in 1869-70

MODERN furnaces at Hokendauqua, Pa., of Thomas Iron Co., which has been a leading eastern pig iron producer since 1864

COLEBROOK furnaces at Lebanon, typical of the construction of the furnaces built in that district

FURNACE of Delaware River Steel Co., Chester, Pa., which made pig iron used for making plates that went into the first American steel naval squadron

MODERN blast furnace of E. & G. Brooke Iron Co., Birdsboro, Pa., where stacks have been operated by Brooke family for several generations

MODERN stack of Robesonia Iron Co., Robesonia, Pa., which with its predecessors, has been producing iron from Cornwall ore banks for 125 years

Cook, of Wrightsville, was operating Princess furnace. Samuel A. Crozer, a wealthy cotton manufacturer of Chester, established the plant at Roanoke bearing his name in 1882. The Radford-Crane Iron Co. erected a furnace in 1890 at Radford with Samuel Dixon, who was president of the Crane Iron Works, as president, and W. S. Pilling, now president of the Northern Iron Co., as secretary and treasurer. Both the Crozer and Radford furnaces now are the property of the Virginia Iron, Coal & Coke Co., which is the leading interest in the Virginia iron field today.

Knew Iron Business Thoroughly

All these establishments had their reverses peculiar to the Virginia district, but it remained for the Pulaski Iron Co. to become a success from the time the furnace was first blown in, February, 1888. A. J. Dull, of Harrisburg, was the first president, and associated with him were E. P. Borden, Abram S. Patterson, Charles L. Bailey, James T. Doran, John W. Eckman and F. J. Kemble, the president of the Norfolk & Western railway, all Pennsylvania men who knew the iron business thoroughly. All these men have passed away, but as mentioned previously, the present guiding spirit of the company is Horace L. Haldeman, of Marietta. The Alleghany Ore & Iron Co., operating furnaces at Iron Gate and Buena Vista, is controlled by the Lukens Steel Co., of Coatesville, a leading eastern producer of plate.

The iron industry developed an unusually sturdy type of men and it was not at all unusual in Pennsylvania to find the heritage of the industry handed down from father to son. Many of the iron manufacturers became leaders in the affairs of the state and nation. Ethelbert Watts, long in the consular service of the nation, and who died within the last few months, for many years was an officer of the old organization which operated Vesta furnace at Marietta. The father of Andrew Curtin, who was the governor of the commonwealth during the Civil war, was a pioneer in the iron business in Center county. The family of the present governor, William C. Sproul, has been in the iron business in Pennsylvania for several generations. His great-grandfather, Charles Sproul, was a forgewright and afterward became a forge owner on the smaller water powers in the Schuylkill valley. Charles Sproul's son, James, was quite an extensive manufacturer for the early days and up to his death in 1847 conducted large forges and bloomeries along the Octorara creek, and the charcoal blast furnace at Black Rock in Lancaster county. Mr. Sproul was one of the largest land owners in Lancaster and Chester counties and controlled much forest territory from which he made charcoal. His sons continued the business until the advent of the railroad and steam power caused a centralization of the ironworking in other communities. William H. Sproul, the governor's father, concluded his business career as an official of the Chester Rolling Mills, operating the blast furnace at Chester. Governor Sproul is president of the Lebanon Valley Iron & Steel Co., Lebanon, Pa., a large maker of iron mill products.

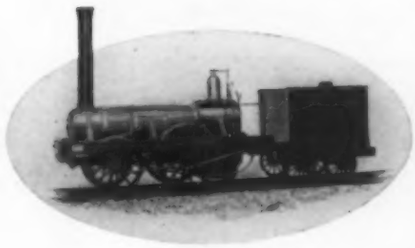
The old ironmaster of Pennsylvania has gone and with him the romantic side of the pig iron industry. The furnace plants which once were the center of their individual communities have been replaced by modern types. Instead of the old hillside stack with its wooden sheds and its mule and ox teams, draying in the ore and charcoal, we have the modern furnace almost outflanked by the towering stoves and stacks, while a minature railroad system is necessary to handle its daily needs of raw material and ship its product to market.

Many Old Plants Abandoned

There are but few men now in the trade who can bring to memory the roll call of euphonious names that once stood for busy furnace plants, such as Aurora, Augusta, Big Pond, Bloom, Cordelia, Caledonia, Coleraine, Conestoga, Duncannon, Donegal, Dauphin, Glamorgan, Glendon, Greenwood, Irondale, Johanna, Lackawanna, Mill Hall, Mount Laurel, Mount Hope, Montebello, Montour, Maranda, Maiden Creek, Norway, New Market, Pine Grove, Roaring Creek, Rock Hill, Swatara and Safe Harbor. Yet these and many others once supplied the foundries of Pennsylvania with their most important raw material.

The long list of abandoned plants serves to illustrate the changes wrought by time and by new methods. But the growing needs of the foundrymen of eastern Pennsylvania are well balanced by the greater pig iron outputs of today, concentrated in fewer furnaces and operated in an era of applied technical knowledge.

Floor of Cylinder Molds in the Baldwin Locomotive Works



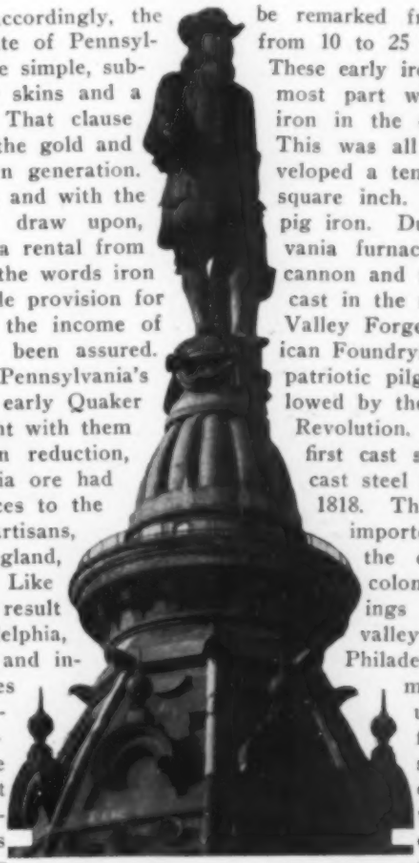
Old Ironsides America's First Locomotive Made in Philadelphia

Philadelphia as a Foundry Center

BY D. M. AVEY

LOOKING down from the lofty tower of Philadelphia's city hall is an imposing statue of William Penn, the city's founder. This wonderful specimen of the art of ornamental casting stands 37 feet high, measured from the simple pedestal to the crown of the Quaker hat. Aside from its interest as an example of the foundry art, this figure bears an especial significance. The casting was produced in the plant of the Tacony Iron & Metal Co. under direction of Francis Schumann, the first president of the American Foundrymen's association, and was raised to its commanding eminence shortly before the first convention.

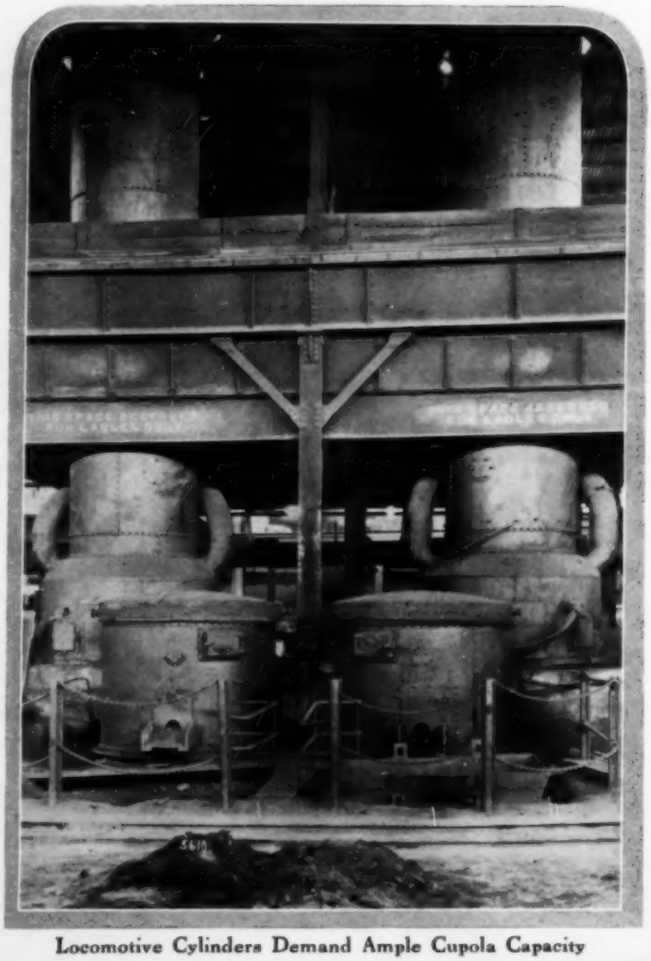
WHEN Charles II, England's most frivolous king, conveyed Pennsylvania to William Penn, he felt sure he had made a good bargain. He had rid himself of the importunities of an insistent Quaker who felt that even monarchs should pay their debts. Furthermore, the territory lying along the Delaware meant little to his royal imagination as the country was wild, the settlers were hardly worth taxing and the resources were extremely doubtful. Accordingly, the land, representing almost the entire state of Pennsylvania was vested in William Penn in fee simple, subject only to a quit-rent of two beaver skins and a fifth of all the gold and silver ore. That clause requiring the payment of a portion of the gold and silver ore is illuminating to the modern generation. Here was a king who in all his wisdom, and with the unbounded realms of imagination to draw upon, specifying only gold and silver ore as a rental from Pennsylvania. Now had he only added the words iron and coal, and had he made some suitable provision for collection through established agencies the income of at least one royal family would have been assured. Gold and silver had she none, but of Pennsylvania's iron—that again is another story. The early Quaker settlers who founded Philadelphia brought with them a knowledge of the processes of iron reduction, forging and casting. Native Pennsylvania ore had suggested forges and later small furnaces to the settlers. The news of these attracted artisans, workers in metal who came from England, Wales, Scotland, Germany and Sweden. Like attracts like in industrial lines. The result was most clearly demonstrated in Philadelphia, where a small industrial nucleus grew and increased until today a circle of 200 miles diameter, circumscribed about old Independence Hall as a center would embrace practically 40 per cent of the foundry business of America and almost 50 per cent of the hardware manufacturing of the world. In the early days Philadelphia throve along metal working lines in proportion even as it does today. The Schuykill and the Delaware offered wonderful facilities for transporting iron from the forges and furnaces further up-state. Originally the foundry industry was one and inseparable with the smelting of iron. In Swank's history of iron-making in Pennsylvania is recorded the fact that the first stoveplate cast in this country, inscribed 1763, was made at the Colebrookdale furnace. By remarkable coincidence the first English cast-iron pots, kettles and other hollow ware by the use of sand molds was produced at the original Colebrookdale furnace in Shropshire, shortly after 1709. In 1789 there were said to have been 14 furnaces in Pennsylvania. These were small, as may be remarked from the fact that they produced only from 10 to 25 tons of pig iron and castings a week. These early iron works of Pennsylvania were for the most part within 40 miles of Philadelphia. Pig iron in the early days sold at about $15 a ton. This was all cold blast, charcoal iron which developed a tensile strength up to 40,000 pounds per square inch. Castings brought twice as much as pig iron. During the Revolutionary war, Pennsylvania furnaces contributed a large share of the cannon and round shot which in most cases were cast in the sand directly in front of the furnaces. Valley Forge, where many members of the American Foundrymen's association will no doubt make a patriotic pilgrimage during the convention, is hallowed by the memory of the darkest hours of the Revolution. In this vicinity some of America's first cast steel is said to have been made. Here cast steel for use in saws was made as early as 1818. The clay for making the crucibles was imported from England. Philadelphia formed the center for the greater part of the colonial iron business. Bar iron and castings which were made in the Schuykill valley were transported down by boat to Philadelphia. The city itself furnished a fair market for the castings which were in use in pre-Revolutionary days. The field was extremely limited. The simplest of kettles and hollow-ware embraced the greater part of what would be considered castings for domestic use. Municipal castings also were unknown. The early waterworks system of Philadelphia was primitive and called for little from the foundry. All the mains were logs, bored through the center and joined by a simple form of flanged connection. These connections were the only iron fittings used. Some of these, which were used in the late years



of the 18th century may be seen today in the Franklin institute located in Philadelphia. The first mention of cast iron pipe used in the city refers to some laid in 1817. This was made in England. About this time, R. D. Wood & Co., Philadelphia, made some of the first cast pipe which was produced in this country. This was only 2 or 3 inches in diameter, and was molded horizontally in 9-foot lengths. Some of the earliest examples of pipe founding have been removed during late years and have been found to be in a remarkable state of preservation. It is interesting to note that the firm of R. D. Wood & Co., which was established soon after the Revolutionary war and which is said to have produced some of the first pipe molded in America still is an active concern, producing cast iron pipe and a varied line of equipment. The offices of this company are in Philadelphia and the main foundry is at Florence, N. J. The present executive of this company is a son of the founder of the institution, who dates back to the early eighties. Careless thought has attributed to the city of Philadelphia a somnolent character, slow, plodding and at times somewhat behind the procession in ideas. It is only necessary to point to a few concrete examples to refute this characterization. Franklin, statesman, philosopher, and inventive genius dominated with his personality the last half of the 18th century and his mastery alone gave to Philadelphia the lead in political, social and scientific thought during that period. Even the foundry industry bears the touch of Franklin's master hand. He published in 1744 a pamphlet describing a newly invented stove or "Pennsylvania fireplace." This was in effect a cast covering for the front of a fireplace, without oven or chimney. The first stoves made in America are thought to have been cast by Christopher Sower of Germantown, which is located only a short ride from the city. Philadelphia's ascribed sluggishness and inertia again is challenged by a name which always is linked with that of the Quaker City, and is known through all the lands where steel rails have shortened time and space. Matthias W. Baldwin was a Philadelphia jeweler. Had the alleged lethargy of the community possessed him, his hall-mark might have adorned a few odd pieces of plate preserved in vaults of some of Philadelphia's old families and hundreds of "Pershing" locomotives might have been built in Sheffield, Newcastle or in Birmingham. Mr. Baldwin formed a partnership in 1825 with David Mason, a machinist, to manufacture bookbinders' tools and cylinders for calico printing. An engine which was purchased to operate some machinery in the factory proved unsatisfactory and as engines were few and similar in design in those days, Mr. Baldwin designed and constructed one on his own ideas. This led to the manufacture of stationary engines and directed Mr. Baldwin's attention to the practicability of steam as a propelling power for traction purposes. In 1830 a few British-made locomotives of a primitive type had been imported, and one which was only partially successful had been built previously by the West Point Foundry, New York. About this time, Franklin Peale, director of the Philadelphia Museum requested Mr. Baldwin to build a miniature locomotive for exhibition purposes. Basing his design on published descriptions of locomotives that had taken part in the Rainhill competition of steam-propelled vehicles held in England, Mr. Baldwin, in April, 1831, completed a small locomotive which ran about a circular wooden track in the museum. This miniature was so successful that in the same year Mr. Baldwin received an order for a locomotive to operate upon the Philadelphia, Germantown and Norristown railroad, a six-mile trunk line, operating horse-drawn cars for passenger traffic. Mr. Baldwin, in company with Mr. Peale inspected the loose parts of a locomotive which had been sent from England. With this scant basis for design, work was started in Mr. Baldwin's small but efficient machine shop. The difficulties of this undertaking may be appreciated when one visits today the modern plants of the Baldwin Locomotive Works

Huge Locomotives Are Assembled Progressively

Cutting the Riser From a Large Bronze Propeller



Locomotive Cylinders Demand Ample Cupola Capacity

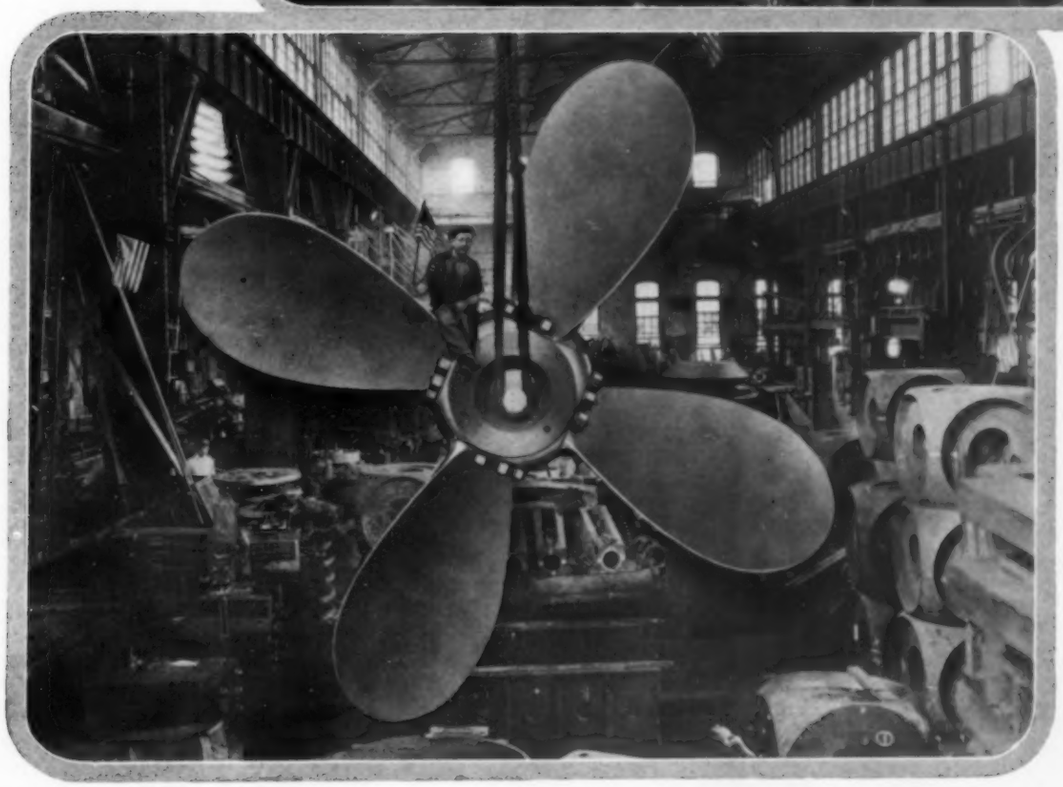
in Philadelphia, or at Eddystone, Pa. No machine tools were at hand for producing and machining the parts. The foundry operations were practically without precedent. Cylinders were bored with a chisel fixed in a block of wood and turned by hand. The wheels were made with heavy cast-iron hubs, wood spokes and rims and wrought-iron tires.

The entire locomotive when completed weighed about five tons. In the trial trip made Nov. 23, 1832, a speed of 28 miles per hour was attained, and it was predicted that a load of 30 tons could be drawn at an average speed of 40 miles per hour on a level road. This locomotive, Old Ironsides, continued for some time a great attraction for the traveler who sought a new sensation. It occupied the place now being taken by the indigent air-plane taken about from place to place to afford rural dwellers a short trial flight.

The Baldwin interests passed through numerous viscissitudes during the early years of locomotive construction, but steadily maintained a place in the lead of advanced construction. The Civil War found the company prepared to aid to the fullest extent in supplying locomotives for government service. Similarly the outbreak of the Great War brought burdens which were handled admirably.

As early as November, 1914, 30 locomotives were ordered for Russia. This was only the first of a series of orders from the allies, and finally from the United States government. In the summer of 1917 the initial order of 150 standard gage locomotives for the American Expeditionary Forces was placed. The first of these was completed on Aug. 10 and the last on Oct. 1. Orders which followed rapidly called for large numbers of similar locomotives, popularly known as "Pershing" locomotives, which were shipped completely assembled with the exception of smoke-stacks, cabs and a few minor details. At the time of the armistice the program of the company called for the completion of 300 engines of this type per month. This was in addition to special-type steam and gasoline locomotives, some of which

The Size and Weight of Ship Castings Demand Great Capacity for Pit and Floor Molding Operations



The First Propeller Delivered to the Hog Island Shipyard Weighed 34,000 Pounds and Was 18½ feet in Diameter

carried steam reservoirs filled from a central boiler. The latter were for use in the immediate vicinity of explosives, where no fire could be permitted. The different types of locomotives which were constructed for all the belligerent nations during the war included the following:

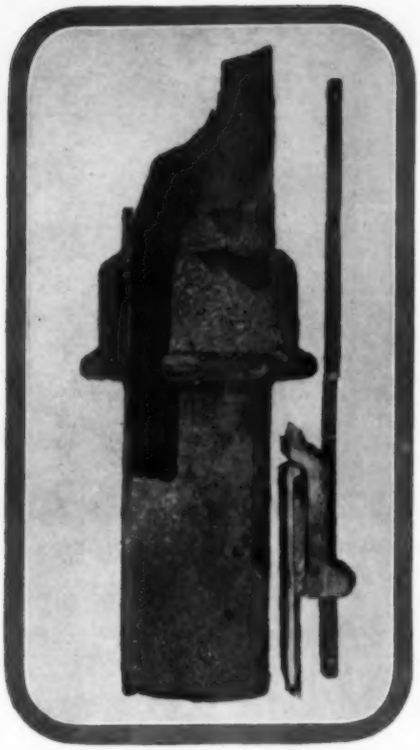
Broad gage steam locomotives	3246
Narrow gage steam locomotives	1146
Broad gage gasoline locomotives	20
Narrow gage gas'l'n locomotives	1139
Total	5551

In addition to this work which was directly in line with the company's facilities over six million shells of various sizes were manufactured by the Eddystone Ammunition Corp., and the Eddystone Munitions Co., subsidiaries of the Baldwin Works. A very important undertaking which was handled with credit to the Baldwin company was the construction of 11 railway gun mounts for the 14-inch navy type gun. This super-gun which was used with deadly effect during the closing months of the war, has been fully described previously in THE IRON TRADE REVIEW. The aggregate of war work handled by the Baldwin works, the associated companies mentioned and the Standard Steel Works Co., another affiliated interest, totaled over $250,000,000.

The foundry capacity necessary for this great establishment has kept pace with the growth of the manufacturing plant. During 1906 a tract of 184 acres was purchased at Eddystone, Pa., about 12 miles from Philadelphia. Here extensive foundries and blacksmith shops were erected. Since 1907 extensive additions to this plant have been erected from time to time. These include further foundry facilities, pattern shops, pattern storage building and erecting shops. All gray iron, malleable and brass castings, are produced in the company's own foundries. All parts of locomotives with the exception of boiler and tank plates, chilled wheels, boiler tubes, and special patented appliances are made in the works of the Baldwin company from raw materials.

The growth of railway transportation did much to bring Philadelphia to the front as a manufacturing city. It also did much to establish its precedence as a foundry center. The trackless pathways of the seven seas, also have brought into being establishments which rival even the Baldwin plant. The city is ideally situated for a seaport. The broad Delaware and the Schuylkill furnish an irregular water front of almost 75 miles, where some 250 ships can be berthed at the same time. Thus natural facilities predestined Philadelphia, the second seaport of the United States, as a shipbuilding center. Hog Island only a short distance from the city is too well known to

Jobbing Shops, Stove and Furnace Foundries and Machinery Plants Contribute to the City's Foundry Supremacy



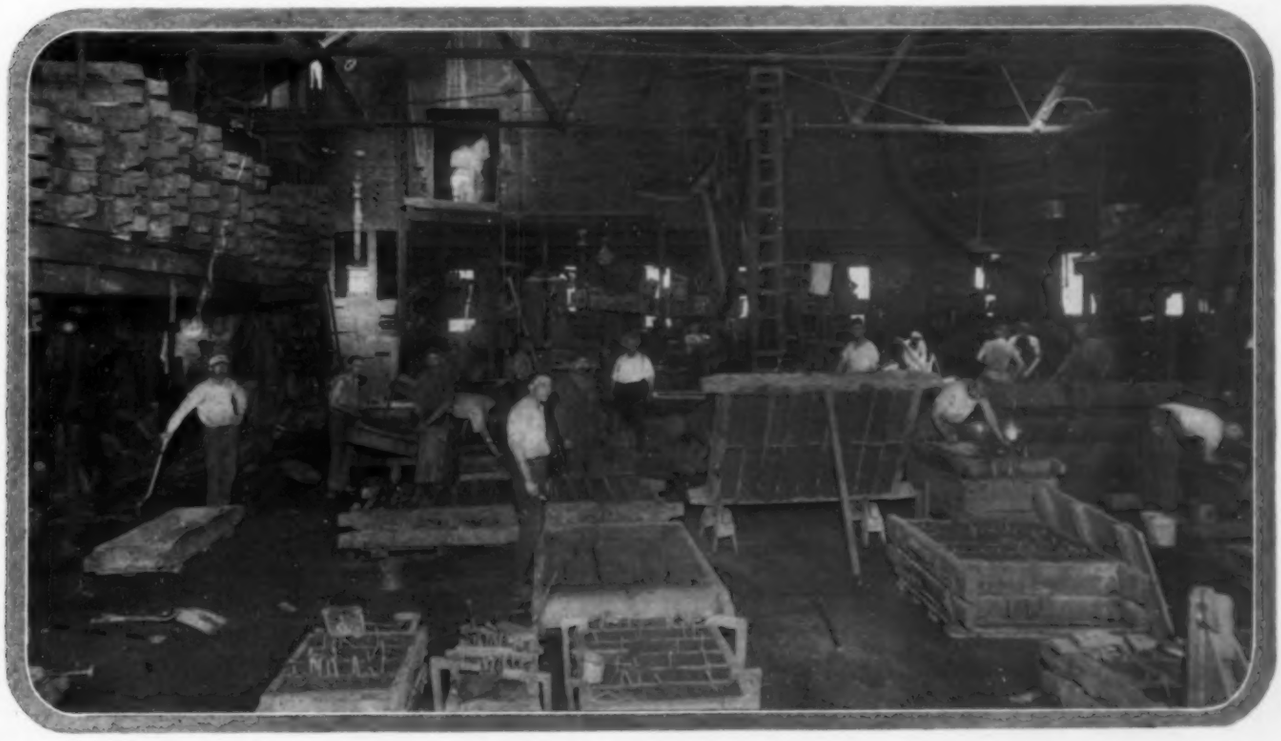
This 6-inch Cast Iron Water Pipe Was Laid in 1827 and Removed in 1915 to Provide a Larger Main

need more than mention. The League Island navy yard at the lower end of the city is particularly interesting to those engaged in the foundry industry through the recent completion of a $1,500,000 casting plant equipped to handle practically any class of work required for the vessels of the navy. This shop is equipped wih four cupolas capable of melting 71 tons of metal per hour in addition to a 3-ton electric furnace.

Along the Delaware is one of the oldest established shipyards in the country. This is the William Cramp & Sons Ship & Engine Building Co. William Cramp commenced building ships in 1830, almost at the same time when Matthias W. Baldwin turned from jewelry to locomotives. The Cramp company was incorporated in 1872. The first man-o-war built in this plant was the New Ironsides, launched in 1862. From time to time, since that date, this yard has contributed its services to the government in the construction of fighting ships, and several foreign battleships were built previous to 1914. The Cramp yard has constructed over 400 vessels since its founding, and from an early date the gray iron, steel and nonferrous metal castings required have been produced in plants operated by the Cramp interests. The foundries of this company have furnished as high as 3,000,000 pounds of iron, 2,000,000 pounds of steel and 1,000,000 pounds of bronze castings per month for use in vessels under construction in its own or other shipyards.

The interdependence of various industries is illustrated by a condition governing in Philadelphia. William Sellers & Co., Inc., is one of the largest manufacturers in America of machine tools for locomotive and railway equipment construction and for shipyard use. It specializes in heavy horizontal boring machines for locomotive cylinders, car wheel boring

Much of the Equipment Used in the Quaker City Foundries is Supplied by Philadelphia Manufacturers



Some of the Oldest Jobbing Shops in Philadelphia Still Are in Existence and Continue to be Actively Engaged

and turning mills, plate and boiler drills, bending machines, hammers, lathes, and slotting machines for locomotive frames. This company is one of the pioneers in metalworking in Philadelphia, and is particularly interesting from its large and splendidly equipped foundries.

The present firm was started in Philadelphia in 1848 by Messrs. Bancroft and William Sellers. In 1853 the firm erected machine shops, forge shops, brass and iron foundries and pattern shops in a number of buildings which still are occupied by the company. The old foundry with its allied shops occupied about 8600 square feet. The death of Mr. Bancroft in 1855 resulted in William Sellers and John Sellers Jr., assuming control of the business. The firm built a new foundry to accommodate its growing requirements in 1883. This has been extended until now the space occupied by the various casting departments is over 57,000 square feet.

The foresight of the designers of the foundry built at that early date is attested by the fact that it still is in use, and the arrangement and equipment provided are regarded as thoroughly efficient for the class of work handled. The foundry built in 1883 originally was provided with power and hand jib cranes which were superseded in 1885 by overhead power traveling cranes. These were indeed remarkable for their day, as previous to this time the slow-speed cranes available had been mere hoisting machines.

Early Molding Machines Used

Molding machines were used in the Sellers' foundry as early as 1860-61, and since that time the development of both hydraulic and pneumatic machines has been followed closely. The Sellers foundries at present do almost no outside work as the company's own requirements utilize over 8,600,000 pounds of castings annually.

So far only those foundries which serve large manufacturing establishments have been considered. These though larger individually constitute only a small portion of the foundry resources of Philadelphia and vicinity. The city leads the world in the production of hardware, including springs, locks, plumbing supplies, mechanics' and household tools. It produces over $40,000,000 worth of general hardware annually, and of this amount exports practically 40 per cent of all such commodities sent out of this country.

An old established house making general hardware, ship chandlery, fittings and jobbing castings is the Thomas Devlin Mfg. Co., headed by Thomas Devlin, who for years has been the president of the Philadelphia Foundrymen's association and was one of the founders of the national body. This company was started in 1865 immediately after the close of the Civil War. Hardware and meat choppers which were just invented formed the main products of the original company.

In 1870 Mr. Devlin became a member of the firm which was known as Carr, Crawley & Devlin. Later Mr. Devlin and Louis J. McGrath started in the malleable fittings business, and in 1880 a new plant was constructed at another location in Philadelphia. In 1902 the Thomas Devlin Mfg. Co. was incorporated and a large plant was built at Burlington, N. J., where a full line of malleable fittings now are manufactured. The two Philadelphia plants still forming part of the Devlin company make various general hardware, meat choppers, lard presses, hot air registers, etc.

When the foundrymen gathered in Philadelphia in 1896 they were advised to visit the stove foundries of the Abram Cox Stove Co., "presided over by A. C. Mott," who was one of those who founded the American Foundrymen's association. This plant still continues a point of special interest as one of the large stove factories of the country. The company was established over 72 years ago. Two foundries are operated, one in Lansdale, Pa., and the other, the original plant in Philadelphia. Every known apparatus for heating or cooking with coal or gas is made at these two factories.

A distinctive and highly specialized class of foundry work is represented in the plant of the American Manganese Bronze Co., located in Holmesburg, a suburb of Philadelphia. This company makes castings, forgings, ingots, rods and sheets of bronze. It specializes in marine propeller wheels, but the varied demands of industry call for the production of heavy hydraulic castings, turbine runners and casings, valves, and gears at various times.

Jobbing foundries handling brass, steel and iron are liberally represented in the city. A characteristic foundry of the latter class is the Girard Iron Works which has been in continuous operation since 1864. This plant produces from 10 to 12 tons per day of medium and light weight castings, particularly high grade machinery castings. The Aetna Foundry which operates the plant formerly owned by the Tioga Foundry Co. is a similar plant which produces about 20 tons per day of castings weighing from a few pounds up to 10 tons.

The Enterprise Mfg. Co. which makes hardware specialties, particularly food choppers, has an interesting foundry which was established over 50 years ago. This plant produces about 25 to 35 tons of small castings per day. These all are utilized by the company of which the foundry is a part.

The extensive textile industry of the eastern states supports a large foundry capacity in Philadelphia. An example of this classification is the Fletcher Works, successors to Schaum & Uhlinger. This company manufactures looms and textile machinery, and centrifugal machines for extracting liquids from raw or finished fabrics, hides, pulp, chemical salts, ore, sand and chemicals and for reclaiming paint, oil and grease from turnings, used containers, rags and waste.

While probably not so well represented in the steel casting branches the Philadelphia community possesses some notable steel foundries. The Midvale Steel & Ordnance Co. which was particularly active during the war produces in normal times over 2200 tons of acid and 6500 tons of basic open-hearth steel castings annually in addition to 9000 tons of iron castings used within the plant itself.

A highly specialized branch of the industry is represented by the Ajax Metal Co. which was established in 1880. This company makes railway and machinery bearings and bearing metals. This was the first company excepting the Cramp interest to enter upon the commercial production of ingot manganese bronze. A complete plant for the recovery and refining of by-products, known as copper-bearing material is operated and recently a new plant has been added to manufacture a type of electric furnace which has been used successfully in the company's own foundries.

Obviously it is impossible to enumerate all the 133 foundries of Philadelphia proper. The city ranks third in the number of casting plants and probably excels all other American cities in the tonnage of castings produced. Furthermore, it is the hub of a great industrial district including other important foundry centers such as Camden, Chester, Burlington, Lansdale and Pottstown. Foundrymen who visit the Inter-Allied Foundrymen's Convention and Exhibition will have an opportunity to visit and inspect some of the most modern and efficient molding and casting plants in the world.

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American Workmen Foil Strike

Foreign Labor Deserts Plants at Agitators' Call But Loyal Employes Stand Firm—Mills Hold Upper Hand at Pittsburgh—95 Per Cent of Strikers Are Aliens—Many Are Intimidated

THE most un-American strike in the history of the country has been frustrated by the loyalty of the American workmen of the iron and steel industry. The nationwide walkout made possible by the stampeding of the foreign workmen, which it was threatened by the radical agitators would paralyze the industry, has failed at the vital points and the outlook is that it has passed the crest. It is estimated that 95 per cent of the strikers have been recruited from the ranks of foreign, common labor. The American employes as a rule, not only refused to join in the strike but have manifested a willingness to return to work the moment the opportunity presents itself. While many plants have been forced to close, this has been due in numerous cases to the crippling of certain essential departments and to the involuntary or coerced absence of nonstriking workmen, rather than to the strength of the strikers themselves. The active number of bona fide strikers has been placed at 20 per cent of the total forces now idle. Steel manufacturers have taken a calm view of the situation, awaiting the opportunity to properly appraise the extent of the offensive movement against them. It is manifest, however, that there is no disposition to adopt aggressive measures to reopen plants now idle.

Pittsburgh Runs Well

The Pittsburgh district with its predominating productive capacity has been the least affected of all the leading steel centers. Conditions there have shown progressive improvement since Monday and some of the foreign workmen who went out at the first call, have reported for work. This has enabled the restoring to production of some of the blast furnaces which had been banked. The principal plants of the Carnegie Steel Co. are running well and it is estimated 75 per cent of the capacity of the company is active. The Jones & Laughlin Steel Co., the largest independent in the Pittsburgh district, has maintained virtually full operations since the strike. In the Birmingham district, the walkout has failed signally while in the East operations in general have been interfered with but slightly. The greatest points of disaffection have been in the Youngstown, Chicago, Cleveland and Buffalo districts, where production is virtually at a standstill. In all centers, blast furnace plants because of the large percentage of common and foreign labor employed have offered a prominent target for attack.

Steel Output Curtailed

In some lines, a continuation of present conditions will bring about a sharp curtailment of finished steel production with its attendant stifling effect upon diversified industry; in others the results promise to be slight. Of those products where the recent demand has been heaviest, sheet and tin plate output is being well maintained both in the Steel corporation and the independent mills. In many of the latter, annual union agreements negotiated some months ago, are effective though in several plants the men have ignored their contracts. Production of tubular goods has been cut considerably though the two largest plants in the country are running virtually full. Apart from Cleveland, the capacity in wire products is well engaged. The most pronounced effect of the strike on the line it now has developed, probably will be in the heavier products including bars, structural shapes, plates and rails. The market on most of these materials recently has been the most contracted of all the mill list.

Pig Iron Held Up

Numerous merchant blast furnaces have been banked though the situation in this respect is considerably more favorable than with respect to furnaces joined with steel works operations. Offsetting this restriction of iron supply, moreover, is the fact that the demand has been sharply reduced by the crippled condition of various steel plants at the present time. Already this has brought requests for the suspension of shipments to the furnaces. In the East, the American Bridge Co., which has been drawing its iron from the Pittsburgh district has opened negotiations for 25,000 to 30,000 tons of basic with nearby furnaces.

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An Un-American Strike

ALL Americans at work, all foreigners out." This statement by an official of a large steel company describing the strike situation and echoed in substance in many quarters since Monday, points to a general condition that well may challenge deep public consideration. Its significance cannot be escaped. It is the foreign element deceived or cajoled by unscrupulous agitators or wilfully vicious in its own designs that has appeared as the most conspicuous factor in the present strike and its train of consequences.

The radical agitators who have engineered this strike with a so-called union, embracing all ranks of labor admittedly have concentrated their main efforts upon recruiting the foreign workers. They have calculated by preying upon the credulity, the prejudices and the limited knowledge of basic conditions of these men that because of the large numbers represented, there could be welded together a formidable machine with which to force the manufacturers to do their bidding. Their professions of sympathetic interest in the wage rates and conditions of employment for these workmen have meant little or nothing. There is only one question involved in this strike and that is the attempt of unionism and radical unionism in its worst form to dictate to the steel industry the conditions under which it shall conduct its affairs. All other claims and protestations are pure hypocrisy or fiction, or have been set forth merely for public consumption.

As the situation has developed, the foreign workmen, necessarily the most ignorant and the lowest class of mill labor, stand in the position of attempting to dictate the form of management of American industry. It is the foreign class exploited by the worst elements of organized labor that has deprived thousands of American workmen of the peaceful right to work at their jobs, this week, is holding back American industry from promised prosperity and is helping materially to block the longed for relief to the American public from the present intolerable conditions of living cost.

And the majority of these foreign workmen have no clear or definite idea as to why they are striking. Actual contact with them in the Youngstown district and elsewhere this week proves this fact. They are striking not because they have real or fancied grievances against their employers but because they have been told to do so by the union and they are obeying the summons.

There is nothing in this strike to mark it as American. In fact, it is essentially un-American in its organization, its designs and its methods. It represents a dangerous thrust against established American institutions. The questions it involves reach beyond the plane of industry into the realm of sound government and orderly society. The steel industry in vigorously combatting this menace of the clamorous and vicious minority is upholding the banner of true Americanism. It should have and will have the wholesouled support of all the reasonable and best elements of American life which must make its eventual victory unquestioned.

Playing Fair with the Public

IN ALL the agitation over the high cost of living the steel and iron industry stands out alone as the one and only branch of business that came to the front when the opportunity offered, cut its prices without cutting wages and has held to the program ever since. Whether the Redfield-Peek plan of interference with the natural laws of supply and demand was wise or ill-advised, a moot point, the steel industry did its bit in the effort to break the vicious circle of advancing costs and advancing wages and did it voluntarily.

Unaided by support from other industries the effort of the industrial board has been futile, but the industry has not reneged, and through the weeks and months following the fiasco prices have been held

at the level then set, with exceptions so slight as to be negligible.

Even when some elements in the trade have been forced to raise prices because costs have mounted, a strong control has been exercised in a way to leave quotations unchanged where necessary supplies could be contracted for without paying the higher figures. Without this strong hold on the lower quotation, a steadying hand that has resisted all blandishments offering a higher level, the market might have run away and surpassed the highest figures of war times.

Radicalism Must Be Eliminated

SENSIBLE suggestions for the avoidance of strikes and lockouts are carried in the proposal of Stephen C. Mason, president of the National Association of Manufacturers for which consideration is asked at the industrial conference to be held in Washington on Oct. 6. A clear conception of the necessity of capital and labor cooperating in a broad way is reflected in the interesting suggestions made. The plan appears easily workable if it were possible to rid the industrial world of agitators, who seek anything but a fair adjustment of differences tending to prevent strikes and lockouts.

It is proposed by Mr. Mason that organized labor and organized industry enter into a gentlemen's agreement to bring to an end the disputes now engaging the attention of the entire country. In short, Mr. Mason is urging that there be no interruption to production and it is his idea that this desirable state of affairs be continued until the President declares an end to the period of industrial readjustment.

The plan of Mr. Mason provides that the President shall appoint a joint committee representing organized industry and organized labor to draw up an agreement, perhaps not unlike that in effect during the war made with the war labor board and to have congress enact legislation stating that such an agreement is made in the interest of the public. Disputes would be settled by an industrial arbitration board.

The forthcoming industrial conference may well give serious attention to the proposal of Mr. Mason as an aid to the solution of the industrial turmoil. Both labor and capital can well afford to declare a truce and submit their differences to a fair board of arbitration. Such a course would probably avoid a vast waste, greatly help in reducing the cost of living, and prevent untold suffering.

It must be said that industry as a general thing has manifested a willingness to deal fairly with its employes and to go as far as it may safely go toward smoothing out troubles with labor. But organized labor, particularly its most radical element, refuses to listen to reason. It wants "direct action."

This element should be summarily delt with through any proper course that is necessary and the better wing of organized labor should join with industry in effecting a truce, under which opportunity may be given for the adjustment of differences. Organized labor must know that it is not going to be permitted to ride roughshod over the rights of employers. In the case of the steel producers organized labor has just as many rights as have nonunion men, no more, and no less, and that is the way it should be. To do otherwise would be unfair to the larger men who choose not to become associated with organized labor.

A War Bubble That Burst

SOME months ago Japanese export and import merchants appeared in the American market as heavy buyers of various kinds of raw materials, including copper, lead, zinc, chemicals, certain ferroalloys, steel products and other commodities. It is estimated that upwards of 20,000 tons of copper, 10,000 tons of zinc and 10,000 tons of lead were sold on this movement. This business was rather surprising to New York sellers at the time. It was difficult to understand why Japan, a producer of copper, should buy the red metal. A producer of zinc herself, why should she buy zinc? Why should she buy lead in the United States with Australian supplies much more convenient geographically? Some few jingoists in this country and England, too, saw war preparations in this buying, especially as the buying included ferrovanadium, used in large gun linings, and certain chemicals used in warlike as well as peaceful purposes.

But recent weeks have seen some heavy resales of copper by Japanese merchants, who reaped a speculative profit of several cents a pounds. Only a part of the copper bought was resold, but the very reselling of it was indicative of the absence of any ulterior motive. Explanation of the Japanese buying is found in the fact that Japan has advanced industrially more than any other country during the war. She has built up a large manufacture of metal products, for which she needs raw materials. Japan likewise has been having its own labor troubles and rising wages. Both copper and zinc production have been largely unprofitable under present economic conditions. It is cheaper to import slab zinc from the United States than zinc ore from Australia for smelting. It is cheaper to buy American electrolytic copper than to work the high cost Nipponese copper properties. Japanese buying can be ascribed to commercial, not to war motives.

Iron and Steel Prices

Corrected to Wednesday Noon

SCRAP, WAREHOUSE, ORE AND OTHER PRICES ON PAGES 868 AND 870

Pig Iron

Bessemer, valley	$27.95
Bessemer, Pittsburgh	29.35
Basic, valley	25.75
Basic, Pittsburgh	27.15
Basic, delivered, eastern Pa.	27.00 to 27.25
Basic, Buffalo, furnace	26.75
Malleable, Pittsburgh	28.65
Malleable, Chicago, furnace	27.25
Malleable, Buffalo, furnace	27.25 to 29.00
Malleable, delivered eastern Pa.	29.75 to 32.90

FOUNDRY IRON SILICONS

No. 2 Northern	1.75 to 2.25
No. 2 Southern foundry	1.75 to 2.25
No. 2X Eastern and Virginia	2.25 to 2.75
No. 1X Eastern	2.75 and up
No. 1 Chicago	2.25 to 2.75
No. 2 foundry eastern	1.75 to 2.25

No. 1X, eastern delivered Phila.	$31.50
No. 1 foundry, Chicago furnace	28.00
No. 2, foundry valley, Pittsburgh	28.15
No. 2 foundry, Buffalo	26.75 to 28.50
No. 2 Northern, Boston	32.40
No. 2 foundry, Cleveland furnace	27.25
No. 2 foundry, Ironton furnace	27.50 to 27.75
No. 2 foundry, Chicago furnace	26.75
No. 2X, eastern del., Phila.	30.50
No. X, eastern, N. J. tidewater	30.60
No. 2X, eastern, Boston	32.90
No. 2X foundry, Buffalo furnace	28.00 to 29.50
No. 2 foundry, del., Philadelphia	29.50
No. 2 foundry, N. J. tidewater	29.60
No. 2 southern, Birmingham	26.75 to 27.50
No. 2 southern, Cincinnati	31.35 to 31.60
No. 2 southern, Chicago	31.75 to 32.50
No. 2 southern, Phila.	33.25 to 34.00
No. 2 southern, Cleveland	31.75 to 32.50
No. 2 southern, Boston	35.50 to 36.00
No. 2 southern, St. Louis	31.00 to 31.75
Virginia, No. 2X, furnace	30.00
Virginia, No. 2X, Philadelphia	34.10
Virginia, No. 2X, Jersey City	34.40
Virginia, No. 2X, Boston	34.70
Gray forge, valley, Pittsburgh	27.15
Gray forge, Buffalo	26.25 to 28.00
Gray forge, eastern Pa.	28.00 to 29.00
Silveries, 8%, furnace	40.25 to 43.00
Ohio Silveries, 8%, Chicago	44.05 to 46.80
Tennessee Silveries, 8%, Chicago	48.65
Low phos. standard, Phila.	39.80 to 41.80
Low phos. Lebanon, furnace	35.00
Low phos. standard, Pittsburgh	39.00 to 40.00
Charcoal, Superior, Chicago	32.75
Charcoal, Superior, Chicago first qr. 1920	33.75

Coke

(At the ovens)

Connellsville furnace	$4.50 to 5.25
Connellsville foundry	6.00 to 6.50
Pocahontas furnace, nominal	5.75 to 6.00
Pocahontas foundry, nominal	6.50 to 7.00
New River foundry, nominal	8.50 to 9.50
New River furnace, nominal	7.50
Wise county furnace, nominal	5.75 to 6.00
Wise county foundry, nominal	7.50 to 8.00

Ferroalloys

Ferromanganese, 80 per cent, delivered producers' price	$105.00 to 110.00
Ferromanganese, 80 per cent, English c.i.f. Atlantic ports	$105.00
Spiegel, 18 to 22 per cent furnace, spot	35.00
Ferrosilicon, 50 per cent, spot and contract, delivered	85.00 to 90.00
Ferrotungsten, standard, per pound contained, furnace	1.20 to 1.30
Ferrochrome, 60 to 70 per cent chromium, 4 to 6 per cent carbon, per pound contained, maker's plant	28 to 30 cents
Ferrovanadium, 35 to 40 per cent, per pound contained, according to analysis	$6.00 to $7.50
Ferro carbon-titanium, carloads, producers plant, per net ton	200.00
Bessemer, ferrosilicon, 10 per cent	49.75
Bessemer, ferrosilicon, 11 per cent	53.05
Bessemer, ferrosilicon, 12 per cent	56.35

Ferrosilicon prices at Ashland, Ky., Jackson and New Straitsville, O.

Semifinished Material

BILLETS AND BLOOMS

(4 x 4 inch)

Open-hearth, Pittsburgh	$38.50
Open-hearth, Philadelphia	42.50
Open-hearth, Philadelphia	38.50
Bessemer, Pittsburgh	38.50
Bessemer, Youngstown	38.50
Forging, Pittsburgh	51.00
Forging, Philadelphia	55.00

SHEET BARS

Open-heath, Pittsbugh	$42.00
Open-hearth, Youngstown	42.00
Bessemer, Pittsburgh	42.00
Bessemer, Youngstown	42.00

SLABS

Pittsburgh and Youngstown	41.00

WIRE RODS AND SKELP

Wire rods, Pittsburgh	$52.00
Grooved skelp, Pittsburgh	2.45c
Sheared skelp, Pittsburgh	2.65c

Shapes, Plates and Bars

(In cents per pound)

Structural shapes, Pittsburgh	2.45c
Structural shapes, Philadelphia	2.695c
Structural shapes, New York	2.72c
Structural shapes, Chicago	2.72c
Tank plates, Pittsburgh	2.50c to 2.65c
Tank plates, Chicago	2.77c to 2.92c
Tank plates, Philadelphia	2.745c to 2.895c
Tank plates, New York	2.77c to 2.92c
Bars, soft steel, Pittsburgh	2.35c
Bars, soft steel, Chicago	2.62c
Bars, soft steel, New York	2.62c
Bars, soft steel, Philadelphia	2.595c
Bar iron, common, Phila.	2.595c to 2.745c
Bar iron, common, Chicago	2.62c
Bar iron, common, Cleveland	2.52c
Bar iron, common, New York	2.62c to 2.77c
Bar iron, common, Pittsburgh	2.75c
Hard steel bars, Chicago	2.55c

Rails, Track Material

Standard bessemer rails, mill	$45.00
Standard open-hearth rails, mill	47.00
Relaying rails, light, St. Louis	38.00 to 40.00
Relaying rails, Pittsburgh	39.00 to 41.00
Angle bars, Pittsburgh base	2.75c
Angle bars, Chicago base	2.75c
Light rails, 25 to 45, mill	$2.10 to 2.45
Spikes, railroad, Pittsburgh	3.35c
Track bolts, Pittsburgh	4.50c
Track bolts, Chicago	4.62c
Track spikes, Chicago	3.62c
Tie plates, Chicago	2.75c to 2.90c

Wire Products

(100 lbs. to jobbers, carloads; retailers 5c more)

Wire nails, Pittsburgh	3.25c to 3.50c
Plain wire, Pittsburgh	3.00c to 3.10c
Galvanized wire, Pittsburgh	3.70c to 3.80c
Barbed wire, painted, Pitts.	3.40c to 3.50c
Barbed wire, galvanized, Pitts.	4.10c to 4.20c
Cut nails, Pittsburgh l. c. l.	5.045c
Coated nails per count keg, Pitts.	2.85c to 3.10c

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Polished staples, Pittsburgh	3.40c to 3.50c
Galvanized staples, Pittsburgh	4.10c to 4.20c

Chain, Piling, Strip Steel

(In cents per pound)

Chain, 1 in. proof coil, Pitts.	5.75c
Sheet piling, base, Pittsburgh	2.55c

Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100 inch and heavier, base per 100 pounds, 5.65c.

Sheets

(In cents per pound)

SHEET MILL BLACK

No. 28, open-hearth, Pitts.	4.35c
No. 28, bessemer, Pitts.	4.35c
No. 28, open-hearth, Chi.	4.62c

TIN MILL BLACK

No. 28, open-hearth, Pitts.	4.35c
No. 28, bessemer, Pitts.	4.35c

GALVANIZED

No. 28, open-hearth, Pitts.	5.70c
No. 28, bessemer, Pitts.	5.70c
No. 28, open-hearth, Chi.	5.97c

BLUE ANNEALED

No. 10, open-hearth, Pitts.	3.55c
No. 10, bessemer, Pitts.	3.55c
No. 10, open-hearth, Chi.	3.82c
No. 10, open-hearth, Phila.	3.795c

Full sheet schedule page 800.

Tin Plate

(Per 100 lb. box)

Tin plate, coke base, Pitts.	$7.00

Iron and Steel Pipe

Base Pittsburgh to Jobbers Carloads

Base, Pittsburgh	Black Per cent off	Galv. Per cent off
⅜ to 3 in., butt, steel	57½	44
⅜ to 3 in., butt, iron	39½	23½

Full pipe schedule page 800.

Boiler Tubes

Steel, 3½ to 4½ inches, l. c. l.	40½
Iron, 3½ to 4½ inches, c. l.	10

Cast Iron Water Pipe

Without War Freight Tax

(Class B Pipe)

Class A pipe is $2 higher than Class B.

Four-inch, Chicago	$58.80
Four-inch, New York	57.30
Six-inch and over, N. Y.	54.30
Six-inch and over, N. Y.	52.70 to 53.70
Four-inch, Birmingham	51.00
Six-inch and over, Birmingham	48.00

Hoops, Bands, Shafting

Hoops, Pittsburgh	3.05c
Bands, Pittsburgh	3.05c
Hot rolled strip steel, Pitts. stamping quality	3.30c
Cold finished steel bars, Pitts., base	3.60c

Cotton ties, lots of 1000 to 3000 bundles, $1.76½ per bundle, mill.

Cotton ties, 3000 bundles and over, $1.74½ per bundle.

Rivets

Structural rivets, Pittsburgh	3.90c
Boiler rivets, Pittsburgh	4.00c
Rivets ⅞ in. and smaller Pitts.	60–5 off

Nuts and Bolts

(Prices f. o. b. Pittsburgh)

CARRIAGE BOLTS

(⅝ x 6 inches, smaller and shorter)

Rolled thread	50–10 off
Cut thread	50 off
Larger and longer	40–5 off

MACHINE BOLTS

(⅝ x 4 inches, hot pressed nuts)

Rolled thread	60 off
Cut thread	50–10 off
Larger and longer	45–5 off
Cold pressed semifinished hexagon nuts ⅝ in. and larger	70 off
Cold pressed semifinished hexagon nuts ⅞ in. and smaller	75–5 off
Gimlet and cone point lag screws	60 off

NUTS

Hot pressed, square blank	2.70c to 3.10c off
Hot pressed, square tapped	2.45c to 2.85c off
Hot pressed, hexagon blank	2.70c to 3.10c off
Hot pressed, hexagon tapped	2.45c to 2.85c off
Cold pressed, square tapped	2.45c to 2.85c off
Cold pressed, square blank	2.70c to 3.10c off
Cold pressed, hexagon blank	2.70c to 3.10c off
Cold pressed, hexagon tapped	2.45c to 2.85c off

Prices Present and Past

(Yesterday, a month ago, three months ago and a year ago)

Prices are those ruling on the largest percentage of sales at the dates named.

	Prices Sept. 24, 1919	Average prices Aug. 1919	June 1919	Sept. 1918		Prices Sept. 24, 1919	Average prices Aug. 1919	June 1919	Sept. 1918
Bessemer, valley, del., Pittsburgh	$29.35	$29.35	$29.35	$36.60	Iron bars, Cleveland	$2.52	$2.52	$2.52	$3.64
Basic, valley, delivered, Pittsburgh	27.15	27.15	27.15	33.40	Iron bars, Chicago mill	2.62	2.62	2.53	3.50
*No. 2 Foundry, Pittsburgh	28.15	28.15	28.15	34.40	Beams, Chicago	2.73	2.73	2.73	3.27
*No. 2 Foundry, Chicago, furnace	26.75	26.75	26.75	33.00	Beams, Pittsburgh	2.45	2.45c	2.45c	3.00c
Lake Superior charcoal, Chicago	32.75	32.75	31.75	37.70	Beams, Philadelphia	2.695	2.695	2.695	3.23
Malleable, valley	27.25	28.65	28.65	34.90	Tank plates, Pittsburgh	2.50c	2.65c	2.65c	3.25c
Malleable, Chicago	27.25	27.25	27.25	33.50	Tank plates, Chicago	2.92	2.92	2.92	3.52
*Southern, No. 2, Birmingham	26.75	26.75	24.25	33.00	Tank plates, Philadelphia	2.795c	2.895	2.895	3.48
*Southern Ohio, No. 2, Ironton	26.75	26.75	26.75	33.00	Sheets, blk., No. 28, Pittsburgh	4.35	4.35c	4.30c	5.00c
Basic, eastern del., eastern Pa	27.00	27.00	25.50	32.00	Sheets, blue anld., No. 10, Pittsburgh	3.55	3.55c	3.50c	4.25c
**No. 2X, Virginia, furnace	30.00	28.25	26.50	33.50	Sheets, galv., No. 28, Pittsburgh	5.70	5.70c	5.65c	6.25c
*No. 2X, eastern del., Philadelphia	30.50	29.60	29.60	34.50	Wire nails, Pittsburgh	3.25	3.25c	3.25c	3.50c
Ferromanganese, 80 per cent, delivered	110.00	110.00	114.00	250.00†	Connellsville furnace coke	4.50	4.30	3.90	6.00
Bessemer billets, Pittsburgh	38.50	38.50	38.00	47.50	Connellsville foundry coke	6.25	5.20	4.70	7.00
Bessemer sheet bars, Pittsburgh	42.00	42.00	41.50	51.00	Heavy melting steel, Pittsburgh	20.50	21.25	17.25	29.00
Open-hearth sheet bars, Pittsburgh	42.00	42.00	41.50	51.00	Heavy melting steel, eastern Pa	19.00	19.60	16.15	28.50
Open-hearth billets, Pittsburgh	38.50	38.50	38.00	47.50	Heavy melting steel, Chicago	19.00	20.75	16.75	29.00
Steel bars, Pittsburgh	2.35	2.55c	2.35c	2.90c	No. 1 wrought, eastern Pennsylvania	27.00	27.25	22.50	34.00
Steel bars, Chicago	2.62	2.62	2.62	3.17	No. 1 wrought, Chicago	21.00	23.25	18.70	33.50
Iron bars, Philadelphia	2.595	2.595	2.595	3.73	Rerolling rails, Chicago	25.50	29.00	19.25	34.00

*1.75 to 2.25 silicon. **2.25 to 2.75 silicon. †70 per cent.

Demand for Prompt Iron Grows

Banking of Numerous Furnaces Causes Consumers to Cast About for Supplies — American Bridge Co. Seeks Basic Tonnage in East, Due to Pittsburgh Conditions — 1920 Sales in New England Are Active

Philadelphia, Sept. 23.—Pig iron demand aparently has been stimulated by the fear on the part of some consumers that operations at the blast furnaces may be curtailed by the strike. Numerous consumers having ample storage facilities are inquiring for large tonnages for prompt and nearby delivery and since these tonnages are in excess of the consumers' capacity, the furnaces figure these users desire to protect themselves against eventualities. Among current inquiries are 5000 tons of foundry iron for the Bridgeport Crane Co., 4000 tons for the Whitin Machine Works, Whitinesville, Mass., 3000 for the Draper Co., Hopedale, Mass., and others. Inasmuch as furnaces in most cases have disposed of their output through this year, it is hard to get large tonnages for early shipment. Considerable iron was held the past week for this year at higher prices. In fact eastern Pennsylvania market now may be quoted at $29 furnace for No. 2 plain (1.75 to 2.25 silicon), $32 for No. 2X (2.25 to 2.75 silicon). Makers who had been holding for these figures for some weeks without doing any business, report sales of thousands of tons the past week. Included in the sales was 1000 tons of high manganese for Pennsylvania railroad. A promising inquiry due to strike is from American Bridge Co., for basic which is due to the situation in the Pittsburgh district obstructing shipments to that consumer. It is inquiring as to available tonnage this grade in case it has to purchase for its Pencoyd plant. It is believed this interest may buy 25,000 to 30,000 tons within few days. Otherwise basic is featureless. The only low phosphorus sale reported the past week was 400 tons of copper-bearing. Otherwise the low phosphorus market is featureless and unchanged. Virginian foundry is being sold here for delivery next 30 to 60 days at $30 furnace for No. 2X. Very little Virginia No. 2 plain is available. Considerable Virginia high manganese and high silicon is being sold with usual differentials.

One maker has taken orders for 2600 tons copper-bearing low phosphorus iron so far this month with minimum price of $35, furnace.

Foundry Sales Are Numerous

Boston, Sept. 22.—With 1920 iron offered at the same level with this year's delivery, New England foundries have been rushing into the market. During the past week, approximately 14,000 tons of foundry iron for 1920 delivery was placed through Boston dealers. This was mostly No. 2X (2.25 to 2.75 silicon), although several lots were for the higher silicon grade. One order of 600 tons of 3.75 and above, silicon, was sold to a special machine manufacturer in eastern Massachusetts for first quarter delivery at $33 Buffalo. The largest buyers have been the textile machine plants, and sales to this class of consumers have amounted to approximately 10,000 tons. The Draper Corp. has not yet purchased, although it is understood an order in the neighborhood of 15,000 tons is contemplated, and may be placed this week. The orders that were placed, ranged from small tonnages to 4000 tons and for the bulk of the 1920 business the price was $29 Buffalo for No. 2X. Sales from other districts have been reported at an advance of more than $1 above this, delivered to consumer. Alabama furnaces are quoting 1920 iron at $30 for No. 2, 1.75 to 2.25 silicon, $31.20 for 2.25 to 2.75 silicon, and $32.40 for 2.75 and up. One thousand tons of malleable was sold to a Rhode Island consumer at $32.90 delivered. The Chapman Valve Co., Springfield, Mass., bought 500 tons of No. 2X at under $31 delivered. The steel situation has as yet had little effect on the foundry iron market. One western Pennsylvania furnace wired its refusal to accept orders for foundry iron which it has received. Many jobbing foundries have been in the market for immediate or last quarter requirements. Several orders were for Alabama iron, of which 250 tons were sold to a western Massachusetts consumer at $36.50 delivered for No. 2. Massachusetts stove plate manufacturers bought 1000 tons, machine tool plants placed several orders and jobbing foundries in Connecticut and Massachusetts were active in the trading. A large Rhode Island consumer has placed orders for this year which will cover the normal requirements for the entire year of 1920. Total sales of the week through New England representatives is estimated at 20,000 tons.

Prompt Iron Scarce

New York, Sept. 22.—Pig iron for spot and nearby shipment now is harder to obtain in the East. This is due not only to the large amount of business on furnace books for this year, but also to the fact that producers who recently booked considerable business with the intention of going into blast are blowing in at a later date than they originally expected. Consequently, their outout must be applied to contracts and very little is available for disposition at this time. The principal inquiry in the market in this district at this time is one from the Crane Co., Bridgeport.

Conn., for more than 5000 tons, involving 2500 tons of 2.25 to 2.75, and 2500 tons of 2.75 to 3.25 silicon foundry, and 350 tons of malleable, all for prompt shipment. Owing to the scarcity of prompt iron, not as many furnaces as usual are able to quote on this inquiry. Sales during the past week have been restricted to the usual small number of furnaces, since most makers are out of the market due to their previous bookings. Of the iron sold here during the past week, a fair tonnage was sold by a Virginia maker who now is asking $31, furnace, for 2.25 to 2.75 silicon, and $32 furnace for 2.75 to 3.25 silicon; this interest has a base price of $30 on 1.75 to 2.25 silicon, but there is very little foundry iron with such a low silicon content obtainable in the Virginia market at this time. Several thousand tons of Buffalo and western Pennsylvania iron, foundry and malleable, have been sold in this district during the past week, and at least two eastern Pennsylvania makers have booked fair tonnages. It is estimated that sales made during the past week in this district totaled at least 15,000 tons. There is considerable export inquiry before the trade but due to adverse exchange and other factors, these inquiries are materializing into little business.

Strike Interferes With Business

Pittsburgh, Sept. 23.—Consideration of inquiries for pig iron has given way to more important matter of the strike, which has resulted in the banking of several merchant furnaces. Inquiries for foundry iron recently have been quite numerous. Among them was one for 10,000 tons for last quarter for shipment to the East, reported by a brokerage interest, while the inquiries of the National Transit Co., Oil City, Pa., and the Westinghouse Machine Co., East Pittsburgh, were still uncovered when the strike broke. In addition, at least two good inquiries for foundry iron for delivery over first half of next year were under negotiation. This business is off until the situation clarifies and the producers know where they stand. Little interest lately has been observed in the steelmaking grades, but deliveries against contracts were proceeding at a satisfactory rate. It is too early to tell how the strike is going to affect shipments, but as the furnaces which now are idle are merely banked, producers evidently are figuring upon an early resumption. Merchant furnaces to suspend as a result of the failure of sufficient workmen to report are the Alice furnace of the Valley Mold & Iron Corp., Sharpsville, Pa.; the Sharpsville furnace, Sharpsville, Pa., operated by the Allen S. Davison Co., Pittsburgh; the Claire furnace, West Middlesex, Pa., operated by E. W. Mudge & Co., Pittsburgh; the Mattie furnace of the Struthers Furnace Co., Struthers, O.; and the furnace of the Stewart Iron Co., at Sharon, Pa. The Fannie furnace, West Middlesex, Pa., operated by the M. A. Hanna Co., and the three stacks of the Shenango Furnace Co., at Sharpsville, Pa., have not been affected by the strike. Prices of all grades of iron are nominal at the moment in the lack of important sales upon which to base accurately.

Merchant furnaces to bank as a result of the failure of workmen to report are the Alice furnace of the Valley Mould & Iron Corp., Sharpsville, Pa., the Sharpsville Furnace, Sharpsville, Pa., operated by Allen S. Davison & Co., Pittsburgh, the Claire furnace, West Middlesex, Pa., operated by E. W. Mudge & Co., Pittsburgh, the Anna furnace of the Struthers Furnace Co., Struthers, O., and the furnace of the Stewart Iron Co., at Sharon, Pa. The Mattie furnace of the A. M. Byers Co., Girard, O., occasionally a merchant stack, also has been forced to bank. The Fannie furnace, West Middlesex, Pa., operated by the M. A. Hanna Co., still is blowing and two of the three stacks of the Shenango Furnace Co., Sharpsville, Pa., continue in blast. Prices of all grades of iron are nominal at the moment in the lack of any important sales upon which to base them.

Adopt Waiting Policy

Buffalo, Sept. 23.—Furnaces in this territory are pursuing a waiting policy pending the strike and are showing a considerable degree of caution. Only two of the four Buffalo interests are directly affected by the strike. One of the interests affected sold 3500 tons of foundry iron during the past week but is not quoting this week. The two interests unaffected are not selling iron. One is sold up for 1919 and declines to quote for 1920. The other is not willing to take chances with the present unstable labor situation, although it had contracted for limited tonnages of 1920 iron prior to the strike. This maker reports inquiries for between 5000 and 6000 tons of malleable and foundry iron, but is not now quoting.

Demand at Chicago Brisk

Chicago, Sept. 23.—As a result of the banking of merchant stacks, deliveries of pig iron have been interrupted and demand for spot iron is brisk. Sellers having cars in transit are disposing of iron promptly, with a large number of inquiries unsatisfied. Producers are selling only subject to the strike, and orders are not being sought. One broker on Monday sold all the iron he had in transit from the south and other points. Current inquiry includes 500 tons of malleable, 200 tons of No. 2 foundry, and 1000 tons for a Michigan buyer for the first quarter. There are many inquiries for carloads. The coke shortage is the worst menace to the foundries. The supply of Tennessee silveries is nearly exhausted. Small sales are being made. Ohio silveries are also being sold here. Five hundred tons are going to southern Wisconsin. Agricultural manufacturers are inquiring in the open market for small tonnages of basic and bessemer. The strike is limiting most inquiry to prompt shipments, although sellers are willing to book 1920 iron at the present price.

Shipments Are Held Up

Cleveland, Sept. 23.—Orders for holding up basic pig iron and other raw materials have been received by producers from various steelmakers in this and surrounding districts whose operations have been affected by the strike. In one or two cases foundries which have been working on orders for steel plants have asked for suspension of shipments because of the interruption of deliveries on this work. These requests for the holding back of deliveries of iron, however, have been the exception rather than the rule. On the other hand, a good many consumers continue to exert efforts to cover themselves on their requirements after Jan. 1, and some sizable orders have been closed within the past day or two, including one of 6000 tons of foundry iron placed yesterday. Another order of 2000 tons also was closed. These orders were accepted by the makers on the basis of $26.75, furnace, for 1.75 to 2.25 silicon. Other sales of the week have been scattered and light. Furnace operations in this district have been only partially affected by this strike. The two furnaces of the Cleveland Furnace Co. are active but the four stacks of the McKinney Steel Co. are banked. At Toledo and Erie, production is going forward as usual.

Some Contracting Done

Cincinnati, Sept. 22.—The sole topic discussed here is the probable effect of the steel strike on the iron market. The decline in the inquiry for foundry iron is noticeable. There is no demand for either basic or bessemer. Shipments of southern foundry iron are going forward as fast as the furnaces can obtain cars. Some last quarter contracting was done last week, but it is understood that a large part of the iron will be shipped during the first quarter. Southern furnaces are running short of iron with a silicon content of 1.75 to 2.25 per cent, but some of them can still take on a fair tonnage of iron ranging from 2.75 to 3.25 silicon. No southern Ohio furnaces have been affected in any way by the strike, nor is any trouble anticipated. Delayed shipments of coke may cut down producion in the Ironton district unless there is an early improvement. Southern foundry iron (1.75 to 2.25 silicon) is around $28 for this year's shipment, and northern foundry ranges from $27.75 to $28, Ironton, for the same delivery. No quotations are out for next year.

St. Louis Market Quiet But Steady

St. Louis, Sept. 20.—Aside from the sale of a few small scattered tonnages for prompt delivery, principally to the foundries, the pig iron market here is quiet. Consumers are disposed to await labor devolpments before formulating new plans. A brisk inquiry for 1920 iron developed, but was retarded by the strike situation. Consumption in this district continues on a large scale, all foundries being run at full capacity. Strenuous efforts are being put forth by these interests to keep up their supplies of raw material, and considerable trouble is being experienced because of the difficulty in securing the desired grades of iron, and the car shortage. There are many complaints relative to deliveries. Prices hold steady, but with a strong undertone. Southern furnaces are asking $28, Birmingham, for No. 2 (1.75 to 2.25 silicon), for

shipment over the balance of the year. Selling agencies here are earnestly hoping that there will be no advance in price and are advising their principals to hold the market steady.

Southern Market Firm

Birmingham, Ala., Sept. 23.—Pig iron sales are still being made, but cautiously, in southern territory. The market is firm, despite the labor situation. Coal and ore miners are not included among the strikers, and raw material is being kept moving to the furnaces. Labor at the furnaces in this district is colored and the negroes are remaining at their posts. The railroad car shortage is still felt and stocks of iron show but little reduction. It is currently reported that sales have been made for 1920 delivery on a basis of $29 for No. 2 foundry (1.75 to 2.25 silicon).

Uncertain Supply

In Semifinished Material Due to Strike —Finishing Mills Doing Well

Pittsburgh, Sept. 23.—Although the strike of the steel plant laborers has not been more general than was expected by manufacturers it has caused the temporary suspension of some of the independent producers of sheet bars and billets, and a dislocation of production and shipments is probable, rendering uncertain the supplies to the finishing mills. Comparatively little sheet or tin mill capacity is affected by the strike and it is noted that the Carnegie Steel Co., the most important commercial producer of sheet bars and billets, taking in all of its plants throughout the country, is operating at 75 per cent of capacity. At Homestead, Duquesne and Braddock, Pa., the plants of this company were practically unaffected by labor troubles. Youngstown, O., producers, however, have been affected. Wire rods appear to be in ample supply for prompt shipment, and on export business it is hinted that the full premium of $5 per ton over domestic prices is not being insisted upon.

Business is Unattractive

Philadelphia, Sept. 23.—The semifinished market, which for months has been dull here, continues featureless, no orders of size being booked. However, this is not disappointing to the mills as they say the semifinished business is not attractive at present prices. None of western makers are in a position to take any of this business by reason of the strike.

Export Billets Held Up

Chicago, Sept. 23.—With heavy inquiry for semifinished steel in the form of billets and sheet bars for export to England, the leading independent is equally anxious to book 50,000 tons or more of this material to fill in on some new equipment. The foreign exchange situation, however, is such that neither buyer nor seller can absorb the loss brought about by the low price of sterling and it has been impossible up to this time to arrange for the financing of this tonnage.

Coke Shipments Suspend

Banking of Furnaces Brings Flood of Orders to Delay Deliveries — New Demands are Light

Pittsburgh, Sept. 23.—Banking of a number of merchant and steel plant blast furnaces as a result of the strike, has been accompanied by a flood of orders to producers of beehive furnace coke to hold up shipments. New demands, meanwhile, have tapered off to negligible proportions, and the basis on which sales might be made is a matter of conjecture. While oven operators lately have been naming $4.75, ovens, on standard 48-hour fuel, and in some instances have been able to make sales at that figure, the price has in only a few cases been exceeded, and it is doubtful if a bid of $4.50 would have been refused. The market reflects not only the lighter demand, but since the coke market recently advanced partly as a result of a strong coal market, it naturally has been affected to some extent by a weaker coal market, produced by restrictions placed on eastern shipments of coal. Permits now are essential for shipments of coal east, and only by producing evidence that the shipments were intended for export have shippers obtained permits, issued through the Tidewater Exchange. Until the coke producers are able to adjust production to consumptive requirements, it is probable that the market will rule in the buyers' favor. No reliable quotations can be given at present in the lack of business on which to base them. Quotations purely are nominal. Foundries generally are unaffected by the strike and a fairly steady demand still exists for standard 72-hour fuel, with the market well established at a minimum of $6, ovens, and choice brands doing $6.25 to $6.50. The production of coke for the week ended Sept. 13, is estimated by *The Connellsville Courier* to have been 259,900 tons, against 263,742 tons in the previous week.

Germans Take Coke Trade

New York, Sept. 22.—Italian orders, which were beginning to be conspicuous in the demand for American coke for export, have fallen away during the past few weeks, because of the ability of the consumers to obtain fuel in Germany at a considerably lower price and with a much lower freight rate. What the price was is not being divulged, but it is known that considerable tonnage of German coke already has been sold. Domestic coke business in the East comprises a fair amount of spot buying and also some for shipment over the remainder of the year.

Coke Moving Slowly

Cincinnati, Sept. 22.—Considerable complaint is made relative to slow shipments of both furnace and foundry coke. Supplies to some of the southern Ohio furnaces are low and it is now reported that by-product coke is moving very slowly. Some of the delays may be attributed to the shortage of cars, which seems to be increasing. It is almost impossible to get any coke from the Wise County and New River districts. Pocahontas foundry fuel also is unobtainable Connellsville furnace coke is around $5 and foundry grade from $6 to $6.50 New River foundry coke is quoted at $9 to $9.50 and Wise County at $8, ovens.

Car Shortage Still Felt

St. Louis, Sept. 20.—Coke dealers and consumers continue to complain of the car shortage. Eastern producers report they have ample stocks to ship on contracts and orders, but cannot obtain cars. Some borrowing is reported, and the leading by-product interest has been able to furnish small tonnages. Several foundries which have taken on new business for prompt delivery are much worried relative to their coke supplies. Generally, the market has undergone no change, the demand being good. Little is heard in regard to contracts for next year. Most producers not caring to book that far ahead. A fair tonnage of foundry coke was placed during the week for a local foundry.

Strong Demand in South

Birmingham, Ala., Sept. 23.—Demand for coke continues strong. Inquiries are coming in for heavy tonnages of foundry grades. Two or three companies are practically out of the market so far as coke for delivery this year is concerned. Unless the union miners become involved in the iron and steel strike there will be no interference with the coke market in this district.

More Ore Sold

Orders Totaling 130,000 Tons Largest Placed in Month

Cleveland, Sept. 22.—Attention in the ore market is centered almost entirely on the strike in the iron and steel industry and its possible consequences in the market. Despite the strike, sales or ore during the past week were the largest reported for any one week in more than a month. One interested received orders for more than 100,000 tons, 75,000 of which were from a connected interest, while another company has received orders for several small tonnages totaling 30,000 tons. A large company with extensive furnace interests has closed its books for the season, and is now devoting its efforts entirely to getting the tonnage down from the upper lakes. Another company has placed all its tonnage of low phosphorus ores. Companies still having ore to sell are optimistic in regard to the future; they still expect some demand to come out. The strike situation as it pertains to the ore industry is reviewed more fully in connection with the strike developments printed elsewhere in this issue.

Scrap Trade is Curtailed

Strike Condition Causes Holding Up of Shipments—Prices Generally Steady, Though Weaker at Chicago

FOR COMPLETE SCRAP PRICES SEE PAGE 870

Chicago, Sept. 23.—With the inauguration of strikes in steel mills buying and shipment of iron and steel scrap is almost stopped, dealers having received orders from some customers not to ship any more material until further notice, which probably means until the situation has resolved itself sufficiently to indicate what scale of operation can be maintained. Most grades are somewhat weaker with declines of about 50 cents per ton, but cast scrap is strong and moving well. A sale of 2000 tons at close to the prevailing quotation was made recently with numerous smaller sales bringing the aggregate fairly high. Railroad offerings are unusually light, the Chicago & Alton closing a small list and the Chicago, Burlington & Quincy offering a list of only 500 tons.

Foundry Requests Increase

Boston, Sept. 22.—The affect of the steel situation in the scrap market here has been to increase greatly the spread between the grades used by the steelmakers and those used by the foundries. The demand from the steel plants has fallen off sharply simultaneous with an increased demand from foundries. The Cambria Steel Co. has stopped shipment on all scrap originating in this territory, and other steel concerns are doing the same. Heavy melting steel for the first time in several months is accumulating at plants. Steel rails have dropped $1 and heavy melting steel has fallen off nearly as much. It is interesting to note in this connection, that one of the New England steel plants has been buying a fair amount of heavy melting steel during the last 10 days, and today placed an order for several hundred tons. No. 1 machinery has jumped to $29, consumers' price, and sales above this figure have been reported. The local ordnance department is offering further lots of scrap steel.

Dull Market Prices Steady

New York, Sept. 22.—Although trading in the local scrap market is dull, prices continue to hold nominally unchanged. Heavy melting steel is being quoted at $15 to $15.50, although there is not enough business to test the market. From all early reports the mills in the Lehigh valley are able to continue operations, unmolested by strikes, and this has added a note of confidence to sentiment. It is believed generally, however, that buying for the time being at least will be only on a hand-to-mouth basis, pending a decisive development in the steel labor situation. A fair demand is in evidence for cast scrap, and according to dealers this is virtually the only material moving.

Only One Mill Buys

Philadelphia, Sept. 23.—Strike situation has flattened out the scrap market. Only one mill has shown an inclination to buy heavy melting steel during past week but dealers are not interested. In fact, mills generally are unwilling to buy because in case of a tie up they would have great difficulty in receiving shipments and dealers are unwilling to sell since they cannot see any attraction in an order unless there is some assurance they will be able to ship. Sales of other grades are small. Included in the business of the past week was a good sized lot of borings and turnings for chemical use at price which establishes the market on this grade at $17 to $18.

Market is Unsettled

Pittsburgh, Sept. 23.—Business in scrap iron and steel here which for several weeks has been on an extremely limited scale, has come to a halt. Dealers report quite a number of requests for suspensions of shipments on contracts, but quite as many consumers still are taking in shipments coming to them. Prices merely are nominal for under the circumstances consumers are not interested and dealers realize the futility to make sales at the moment.

Scrap Market Not Yet Affected

Buffalo, Sept. 23.—The strike in this district has not yet had any noticeable effect on the scrap market. There is still a strong demand for most grades of scrap, and an exceptionally strong demand for cast iron borings. It is believed that it will be only a matter of a few days, should the strike continue, that the market will begin to feel the effects of a lessening demand. Although only one group of mills have been crippled, it is believed that makers will not want to pile up an excess of stocks.

St. Louis Market Irregular

St. Louis, Sept. 22.—Irregularity continues to feature the scrap iron and steel market, while the undertone is bearish, and prices have a downward tendency. Dealers lists show reductions during the week ranging from 50 cents to $2 on virtually all grades. The steel strike situation is the principal factor making for unrest. Consumers show a disposition to hold off, and dealers are not doing much speculating, while offerings are not large. Some of the industries, notably the foundries, are making inquiries, but are not willing to pay what dealers ask. Mills are well supplied with material under contract, but foundries have enjoyed a business far in excess of expectations, and some have been obliged to enter the market. Fair quantities of various grades of scrap still remain in the yards, as a result of the buying during the past few months. The strength of the pig iron market is a source of considerable encouragement to scrap interests. There is a marked scarcity of low grade pig, and consumers are using scrap whenever possible.

Dullness More Pronounced

Cleveland, Sept. 23.—Dullness which has featured the local scrap iron and steel markets the past few weeks has been accentuated by the strike. The leading users of scrap in this district have shut down, and although the prospects of their resuming at an early date are fair, they have fairly large stocks on hand and claim they will be out of the market for some weeks. The largest buyer in this district has been buying shell scrap from the government and has many months' requirements cared for in this manner. Prices, as a natural result of market conditions, are weak and tend downward.

Plate Orders Are Moving

Eastern Mills Book Fair Amount of Tonnage—8000 Tons of Ship Work Pending—Prices Still Show Spread

Philadelphia, Sept. 23.—Offering of plates has been little affected by the strike as eastern output is not much curtailed by the strike. The Lukens Steel Co. whose operations yesterday were handicapped by the crippling of the gas producer department has succeeded in replacing strikers and now is running on same schedule as last week. The Midvale Steel & Ordnance Co. also has made some improvement in this direction at Coatsville. Therefore the plate orders being accepted same as before. Considerable tonnage has been booked lately and one eastern mill by reason largely of export orders is practically closed upon its tonnage for the rest of the year. Among new plate orders is one for 8000 tons of plates and shapes for vessel work in this district which is on the point of being closed. The prevailing eastern price on domestic business is 2.65c Pittsburgh but sevtral orders lately have been taken at less and in some cases at 2.50c. The American Locomotive Co. last week placed a tonnage at latter price.

Demand Still Extremely Light

Pittsburgh, Sept. 23.—While good demands are being made upon the plate mills by the tank makers, almost no demand is coming from car and shipbuilders and the requirements of the former are providing no tax upon mill capacity. Both of the latter appear to have ample supplies of plates and are practically out of the market. Prices still are comparatively soft, with 2.50c, Pittsburgh, the basis of most of the current busi-

ness save in those cases where the inquiry involves only a small tonnage. While the plate card does not call for a quantity differential, a higher price than 2.50c in most cases is merely a quantity differential.

Western Demand Fair

Chicago, Sept. 23.—In view of present producing capacity of plate mills, present demand for this product is relatively light and most mills are able to take on considerable more tonnage than they have booked at present. The leading independent in this district has filled its books on plates and is out of the market for any delivery before the first of the year.

Pipe Output

Interrupted at Some Plants—National Tube is Little Affected

Pittsburgh, Sept. 23.—While the National Tube Co. and the Jones & Laughlin Steel Co. are practically unaffected by the strike, other makers of tubular goods are in a less fortunate position. The valley makers have suspended operations as have also the Wheeling, W. Va., manufacturers. The A. M. Byers Co., makers of wrought iron pipe, operating under an agreement with the Amalgamated Association of Iron, Steel and Tin Workers, has its Pittsburgh works running full, but its Girard, O., skelp works are idle because common labor went out at most of the blast furnaces and the rolling mills left the puddlers idle although they were ready to work. No letup is noted in the demand for lapweld pipe, but with production likely to be thrown out of gear by the disturbance, all inquiries are being turned down.

State Wants Tonnage

New York, Sept. 22.—Bids are being closed this week by the commonwealth of Pennsylvania on about 1500 tons of pipe for use in connection with the soldiers and sailors memorial bridge at Harrisburg, Pa. This is one of the largest tonnages up at the present time, although there appears to be an improvement in municipal demand, which is resulting in more sizable inquiries coming out.

Chicago Buying Slow

Chicago, Sept. 23.—Practically no tonnages of cast iron pipe have been closed in the Chicago district recently, although a number of projects are under consideration. Bids were opened at Detroit Sept. 18 on about 5000 tons on which the award has not yet been decided. Bids will be opened Sept. 29 on 100 tons of 12-inch pipe at Milwaukee and Broadwater, Nebr., will open bids Oct. 7 on 100 tons. One important maker has advanced its quotations on smaller size pipe, asking $59.80 delivered Chicago, on six and eight-inch, $62.80, on four and $69.80 on three-inch.

Oklahoma Buys Much

St. Louis, Sept. 23.—The United States Cast Iron Pipe & Foundry Co. has taken 1872 tons for Enid, Okla., and 850 tons for Ponca City. Inquiry for the south and southwest is unusually strong, and considerable business is expected to follow later.

Shape Demand Continues

Structural Market Fairly Active Despite Strike—Chicago Building Trades Resume Work

Chicago, Sept. 23.—With the strike and lockout of building trades in Chicago settled and workers returning to their duties the first of this week, the already heavy demand for structural material is expected to enlarge considerably. Unless the steel mill strike prevents delivery of this material, large tonnages should be placed within the next few weeks from among projects temporarily held up by the former strike. The leading independent has its structural capacity well sold except for heavy sections which it cannot book at present from lack of roll equipment on its new mill. Specifications are being received already on contracts placed for structural work in Chicago which had been held back by the local situation. The largest tonnage of structural material placed in the west during the past few days involves 810 tons for two armories for the University of Iowa, at Ames and Iowa City. The Times-Picayune building at New Orleans, which required 624 tons of structural steel, has been changed to reinforced concrete. The buildings for Montgomery Ward & Co., at Springfield, Ill., to be used as an engine manufacturing plant, are being redesigned and temporarily are out of the market.

Big Bridge in Prospect

New York, Sept. 22.—Little activity is in evidence in the local structural market. Several sizable tonnages which have been before the trade for some time are still pending, and new inquiries of importance are scarce. A new project of considerable importance, although in the preliminary stages, is a New York Central railroad bridge over the Hudson river, near Albany, N. Y. It is expected that about 15,000 tons will be involved. At the present time there is some controversy between railroad officials and state authorities as to the type of the bridge. Prices are strong, it appearing $90, erected, is the lowest available quotation on the general run of material. So far as can be learned, eastern fabricating shops have as yet been little affected by the strike.

Eastern Mills Get Orders

Philadelphia, Sept. 23.—Shape offerings have not been interfered with in the east by the strike as no eastern shape mills are down. The inability of the western mills to make promises is enlarging somewhat the new business of eastern makers. Due to fears of extension of the strike, consumers are specifying liberally on contracts and want deliveries so as to have some material in reserve. The market is devoid of structural lettings.

Not Crowded with Orders

Pittsburgh, Sept. 23.—The position of the shape mills in the matter of bookings shows little improvement. Few of them have more than a few weeks' business in sight, though fabricating interests are getting some business and report a heavy volume of inquiries. While it cannot be said that structural jobs are bringing materially higher prices, a somewhat firmer tone is apparent and some tendency is observed on the part of investors to speculate, which is ascribed in some quarters to a belief that the latter expect higher prices. A case is cited of a project involving 2500 tons, the erection work on which will hardly get under way until next summer, while the buyer is now seeking an option on the steel.

Report Business Still Good

Cleveland, Sept. 23.—The strike in the iron and steel industry has not as yet affected the market in this district for small tonnages of structural shapes, and the leading fabricators report that business is still good. The inability of small mills to produce material may eventually force some of the fabricators out of the market, but the general opinion among the fabricators, who have sought to appraise the strike situation because of its possible effect on their business, is that there is no cause for alarm. They believe the strike will be short lived, and say their reports indicate that it will be a failure. The Fort Pitt Bridge Works took 420 tons for an extension to the plant of the Erie Tire & Rubber Co., Sandusky, O., and several smaller jobs involving in the aggregate a good tonnage. Another interest received orders for several hundred tons of shapes.

CONTRACTS AWARDED

Extension to plant of Erie Tire & Rubber Co., Sandusky, O., 420 tons; to Fort Pitt Bridge Works.

Building for International Motor Truck Co., Allentown, Pa., 1000 tons, to the Austin Co., Cleveland.

Plant for the Cleveland Rubber Mold Foundry & Machine Co., Cleveland, 275 tons, to J. E. Morris Iron Works.

Two armories for state University of Iowa, 810 tons, to McClintic-Marshall Co.

Times-Picayune building, New Orleans, 624 tons, to reinforced concrete.

Galvanizing building for Hubbard & Co., Chicago, 378 tons, to Union Foundry Works.

Bridge near Lick, Ill., for the United States railroad administration, Chicago & Northwestern railroad, 137 tons, to American Bridge Co.

Alterations and extensions to power house, for Little Rock Railway & Electric Co., Little Rock, Ark., 181 tons, to American Bridge Co.

High school building at Aurora, Minn., 122 tons, to American Bridge Co.

CONTRACTS PENDING

Two highway spans for state of Idaho, 250 tons, inquiry pending.

Factory building for Bridge & Beach Mfg. Co., St. Louis, 800 tons, bids being taken.

Hotel at Detroit, owner withheld, 1400 tons, Fridstein & Co., engineers, taking bids.

Lima hotel, 300 tons; bids being taken.

The Gary Foundry & Machine Co., Gary, Ind., has raised its capital from $15,000 to $100,000.

Urge Shipments of Bars

Consumers Besiege Mills for Quick Shipments—New Business Generally is Being Declined by Makers

Chicago, Sept. 23.—All classes of steel bar consumers have been besieging mills for as prompt delivery as possible, indicating either a heavy consumption in manufacturing operation or desire to put as much stock on their yards as possible before the strike could cut off their supplies or reduce them. New business in soft steel bars is fairly slow, and offers small tonnages at the moment, probably largely the result of the strike situation. The leading independent is completely sold out on soft steel bars for the remainder of this year and has withdrawn from the market for the present.

Quietness, which has prevailed in the bar iron market for some time, continues to be much in evidence and one mill, which has been down the past two weeks, was started Monday with sufficient tonnage to insure operation during the present week. No change in quotations has been made. Demand for hard steel bars rerolled from rails holds up well, with demand coming mostly from manufacturers and comparatively little from reinforced concrete users.

Some Bar Mills Affected

Pittsburgh, Sept. 23.—With the Youngstown district plants of the Carnegie Steel Co. and those of the Republic Iron & Steel and the Youngstown Sheet & Tube companies, Youngstown, O., and the Cambria works of the Midvale Steel & Ordnance Co., Johnstown, Pa., idle as a result of the strike, much steel bar mill capacity is down. Bar mills in this district of the Carnegie Steel Co. are only slightly affected and the Jones & Laughlin Steel Co. is running its bar mill practically full. The operation of the bar iron mills here are unhampered as leading manufacturers are working under an agreement with the Amalgamated Association of Iron, Steel and Tin Workers. Good demand is noted for both steel and iron bars but under the circumstances little business is being done. Strong demand also is noted for concrete reinforcing bars. The Witherow Steel Co., Pittsburgh, has been awarded 2000 tons for a new warehouse in Baltimore.

Accept New Business Carefully

Philadelphia, Sept. 23.—Because of the strike situation, the mills are careful in entering new business, particularly in steel bars in which makers are booked up most heavily. Several mills are out of market entirely on bars while they are accepting specifications on contract they are not giving any assurances whatever as to when they will ship. One mill which now is out of the market sold considerable tonnage last week prior to its withdrawal at its new price of 2.50c, Pittsburgh.

Bolt Shipments Heavy

Chicago, Sept. 23.—Mills producing bolts and nuts are unusually busy with specifications on contracts being filed in heavy tonnage, while new business is being offered in steady volume. Most makers are unable to take on further orders or at least cannot extend their sales beyond the needs of regular customers. In most instances present obligations will cover production practically to the end of the year.

Demand Unevenly Distributed

Pittsburgh, Sept. 23.—Fairly good demand still is reported for cold finished steel and shafting, but it is not especially well distributed in the various sizes and shapes, as automobile and tractor builders still are by far the best buyers. The new card issued as of Aug. 18 is being employed by all makers and all confusion attending its introduction has disappeared.

Stock Demand Grows

New York, Sept. 22.—Local warehouses are in receipt of an increased demand, and this development is accounted for in part by the steel strike. Consumers, fearing that there may be a shortage as a result of possible seriously curtailed mill operations, are said to be buying from the warehouses on a larger scale than at any time this year. This buying still, however, is being confined chiefly to sheets and bars, particularly the former. Structural shapes and plates do not appear to be affected to any extent by the improved demand for warehouse materials generally. While the strike may result in a considerable movement of warehouse supplies, it presents a possibility of considerable difficulty to warehouse interests in keeping up supplies. Prices are firm but unchanged.

Warehouse Prices Unchanged

Boston, Sept. 22.—New England warehouse prices have not changed, although an advance has been expected daily ever since the New York and Chicago districts adopted new schedules. Trading is heavy, particularly in sheets and plates, and this together with the steel situation is said to bring about conditions which compel an early price advance. Galvanized sheets are expected to advance within the next few days, and according to one warehouse man undoubtedly they will go up before the end of the week. For some time past deliveries from the mills have not been keeping pace with sales, and this condition alone points to a rising market.

Sheet Mills are Still Busy

New Demands Coming Out, But Producers are Committed to End of Year—Strike Has Little Effect

Pittsburgh, Sept. 23.—The strike of steel plant workmen has affected the sheet mills considerably less than most of the other finishing mills. A large number of the independent manufacturers are working under agreements with the Amalgamated Association of Iron, Steel and Tin Workers, the members of which have been cautioned not to quit work at such plants. All of these "closed shop" plants are running 100 per cent, but a number of independent mills running as "open shops" also are unaffected. Should the strike become more general and last any considerable length of time, the latter as well as the union plants would be affected through a failure of the sheet bar supply. The Apollo Steel Co., Apollo, Pa., suspended Monday through the failure of enough men to report, but this plant expects to resume shortly as the men are believed to be satisfied, but in fear of bodily injury. Some of the plants of the American Sheet & Tin Plate Co. were adversely affected by the strike, but none of them was obliged to suspend operations. New demands for sheets still are coming out, chiefly from consumers, who are fearful of not obtaining full shipments against their contracts and want to be protected. Little attention is being paid to these demands, as every plant in the country is committed for probable production over the remainder of the year, and manufacturers do not want to obligate themselves into 1920, as they would by taking on new business.

Try to Accumulate Stocks

Philadelphia, Sept. 23.—Sheet business here is good and the market can be considered strong. Makers report that in addition to new orders received, consumers are specifying actively on contracts in order to accumulate a reserve of material in case the strike prevents shipments later. Eastern makers are not affected by the strike so far although it is considered likely that trouble along this line will not be escaped altogether.

Accept No New Business

Youngstown, O., Sept. 22.—With virtually the entire steel producing capacity of the Mahoning valley either closed down or seriously crippled by the strike, books of all important companies have been closed to new business. All of last week witnessed a heavy volume of inquiries for sheets, tubular goods and other products, with the exception of plates. Many buyers were anxious to get on the mills' books before the strike, although the normally swelling demand accounted in large measure for the stimulated business.

The export inquiry continues heavy

with black and galvanized sheets 16 to 30 gage being in exceptional demand. Domestic users are particularly insistent upon Nos. 14, 16, 18 and 22 sheets. Dealers' stocks in the valley are low with pickled sheets for stamping especially scarce and in great demand. One dealer reports a few odd lots of galvanized and blue annealed sheets on hand. Deliveries are difficult, however, because of the lack of common labor. One interesting development of the market growing out of the strike and the consequent shortage of products, is that dealers with stocks on hand are getting from $4 to $10 per ton or even higher premiums above the old price. Because of uncertainty regarding their ability to deliver orders and the price adjustments that will be necessary at the conclusion of the present trouble, producers are flatly refusing to book new business.

Wire Mills

Are Little Affected in Various Districts—Nails Are Sought

New York, Sept. 22.—The plant operations of eastern wiremakers have been practically unaffected by the strike call. The mills at Worcester, Clinton, New Haven, Trenton and Allentown are reported to be operating at 100 per cent. Wiremakers continue to find it necessary to pursue a careful policy in booking business due to the large amount of unfilled orders on their books. In fact, the mills continue to limit their customers to the tonnages which they booked in normal years in the past, as they are unable to exceed those deliveries at present.

Most Makers Down

Pittsburgh, Sept. 23.—The Pittsburgh Steel Co., the Cambria Steel Co., and the Youngstown Sheet & Tube Co. are closed down because of labor trouble and wire mill production consequently is much curtailed. The Jones & Laughlin Steel Co., however, still is running with a full complement of men and the Schoenberger plant of the American Steel & Wire Co. has not lost a man as a result of the strike. Marketwise, conditions are in an unsettled state.

Nails Especially Sought

Chicago, Sept. 23.—Manufacturers of wire and nails find two factors united to increase demand for nails on top of the heavy requirements of the market previously. Settlement of the strike and lockout of the building trades, work being resumed this week, has brought about a tremendous demand for nails through Chicago jobbers. The recent heavy storm on the gulf coast of Texas has given a tremendous increase to the need for nails in that locality. Manufacturers are making special efforts to meet these demands and care for other trade at the same time. Imminence of the steel strike has also caused jobbers and users to ask anticipation of shipments wherever possible.

Ferromanganese Quiz On

Trade Commission Questioning Importers of English Product—Inquiries Light—Little Business in Spiegeleisen

Philadelphia, Sept. 23.—The letter which domestic ferromanganese producers recently sent to federal trade commission accusing English producers of violating antidumping law apparently has had effect of advancing price on English metal. One importer now is offering English metal at $110 delivered which is equivalent to approximately $105, tidewater, the usual method of quoting English metal. The new English figure is the same as the present domestic price. Other English producers continue out of the market. Practically no ferromanganese is being sold. Such inquiry as was pending has been withdrawn owing to the strike.

While some business in spiegeleisen done at $38 furnace it was small and exceptional and metal can be had freely at $35 for 18 to 20 per cent, a round tonnage of spiegeleisen was sold at $35 and several inquiries in market for 1000 to 2000 tons.

Investigation Proceeds

New York, Sept. 22.—The federal trade commission is proceeding with an investigation of charges recently brought by domestic producers of ferromanganese that English makers have been violating the antidumping act. Some of the importers have received inquiries from the commission for information.

No English ferromanganese now is being sold or offered here as far as known, since these producers have withdrawn from the market. At least one of them has no more metal to offer for shipment this year. It is learned that approximately 3000 to 4000 tons of English ferromanganese were sold at $95, c.i.f. Atlantic tidewater, prior to the withdrawal. It appears that there is no foundation for any reports that English ferromanganese was offered at lower than $95. Inquiry for ferromanganese now is limited. One West Virginia user had an inquiry out for a round tonnage but has withdrawn.

Current inquiries for spiegeleisen call for 1000 to 2000 tons. There has been very little business and the market largely is nominal. Metal containing 18 to 22 per cent manganese may be quoted at $35 furnace.

While most of the important Canadian makers of 50 per cent ferrosilicon are asking prices approximating those named by American makers or around $95 to $100 delivered, it is understood some holders of Canadian alloy are making sales much lower. Some of this alloy or further lots of American resale metal figured in the recent sales of small tonnages around $80 to $83 delivered.

The tungsten situation is unchanged. Recently a meeting of consumers and importers of tungsten ore was held in New York to determine the attitude of the trade to the bill now pending to impose a duty on imports. The meeting was unanimously opposed to the amendment imposing a retroactive duty on stocks of ore already here, while opinion as to the bill generally was divided. A committee was appointed to watch the bill. The ferrotungsten market has taken little note of the bill, prices remaining about $1.20 to $1.30 a pound contained.

Ferrovanadium is unchanged at about $6 a pound contained for high silicon alloy and $7 to $7.50 a pound for low silicon alloy. The ferrochrome market is irregular. Some small lots have been sold at 31 cents a pound for 4 to 6 per cent carbon.

Market is Unsettled

Pittsburgh, Sept. 23.—Business in ferromanganese has nearly come to a halt, not so much as a result of the labor troubles as because of uncertainty in regard to prices. Both domestic and English producers recently have quoted $110 on 80 per cent material, the former making the price delivered, while the latter's quotation has been c.i.f. Atlantic seaboard. Latest advices from the East are that most of the English makers have withdrawn all quotations. The market is weak on 50 per cent ferrosilicon, for demands are confined entirely to small lots for immediate shipment. Such sales have averaged about $80, furnace, freight allowed, but less than that price was done recently on sales to Pittsburgh district consumers. Although some makers are holding this material as high as $100, furnace, freight allowed, the market as far as actual sales are concerned is more nearly quotable from $76 to $80. Little interest is noted in the other ferroalloys. Ferrotungsten still is offered as low as $1.15 a pound here.

Tin Plate Mills

Little Affected by Strike—New Inquiries Fairly Numerous

Pittsburgh, Sept. 23.—Beyond the suspension of the operations by the McKeesport Tin Plate Co., which shut down its plant last week because of a congestion in its shipping department, and a walkout of sufficient men to hamper some of the mills of the American Sheet & Tin Plate Co., matters are moving along in the tin plate industry much as though the strike had not been called. Mills working under an agreement with the Amalgamated Association of Iron, Steel and Tin Workers are unaffected, while a number of open-shop plants also are operating at full capacity. Unless the strike becomes more general and lasts long enough to affect supplies of sheet bars, mill operations are likely to continue comparatively full. New tin plate demands still are fairly numerous, especially for export, but most makers are too heavily committed to give them much attention.

Mining Engineers Meet

Conventions of Five Societies Open in Chicago — Fifth Exposition of Chemical Industries Surpasses Previous Shows

CHICAGO, Sept. 22.—An important convention week was ushered in at noon today when the fifth national exposition of chemical industries opened in the Coliseum and the First Regiment armory. The exhibition, which comprises equipment used in the electrochemical, mining and metallurgical industries, occupies every foot of space available in the two large halls and surpasses previous shows of its kind in the number and diversity of products shown. Among the booths in the Coliseum attracting attention is that of the Buffalo Foundry & Machine Co., where vacuum drying apparatus, caustic pots, nitrators, etc., are exhibited. The advance made by American manufacturers of dyes during the war is reflected in the exhibit of the National Analine & Chemical Co., New York, which is displaying fabric dyes, an assortment of colored fabrics, and views of dyeing operations. The exhibit of the Semet-Solvay Co., Syracuse, N. Y., consists of the reproduction of a blast furnace. Electric furnaces, tool steel and pyrometers and other accessories used in the treatment of steel are attractively displayed.

The exposition is being held concurrently with the annual meetings of the American Institute of Mining and Metallurgical Engineers, the American Electrochemical society, the Technical Association of Pulp and Paper Manufacturers, the American Steel Treaters' society and the American Ceramic society. The first technical sessions of the American Institute of Mining and Metallurgical Engineers were held this morning when papers devoted to nonmerrous metallurgy and metallography and coal and gas were read. In the afternoon simultaneous sessions devoted to coal and gas, geology, milling and industrial organization were held. At the last named session, three papers prepared by Charles F. Willis, dealing with the method of curtailing forces, methods of educating workmen and the operation of a system of physical examination for employes were read by T. T. Read, United States bureau of standards, Washington. The paper, entitled "Physical Examination Previous to Employment," was published in the Aug. 7 issue of THE IRON TRADE REVIEW. In this paper, Mr. Willis shows that physical examination before employment has proved satisfactory and presents a strong argument in favor of the system, which is the basis of one of the alleged grievances of labor union agitators. In his paper dealing with educational methods, the author emphasizes the need of administering courses for workmen in accordance with the capabilities, habits and environment of those to be trained. "The educational processes," he states, "must be suited to the existing mental development. Traditional methods of training are unsatisfactory."

Monday evening the members and guests of the institute were entertained at a smoker held at the Chicago University club. At the same time, Gov. Frank O. Lowden, of Illinois, delivered the address of welcome at the exposition. John W. O'Leary, president of the Metal Trades association, of Chicago, spoke on the relation of the chemist to the manufacturer.

Engineers Elect Officers

St. Louis, Sept. 23.—More than 225 members of the Association of Iron and Steel Electrical Engineers have registered at the Hotel Statler for the thirteenth annual convention which began Monday. At a business meeting held this morning, the following officers were elected: President, B. W. Gilson, Carnegie Steel Co., Youngstown, O.; first vice president, H. C. Cronk, McKinney Steel Co., Cleveland; second vice president, F. A. Wiley, Wisconsin Steel Co., South Chicago, Ill.; directors, W. S. Hall, Illinois Steel Co., South Chicago, Ill.; C. E. Bedell, Wheeling Steel & Iron Co., Wheeling, W. Va.; J. E. Fries, Tennessee Coal, Iron & Railroad Co., Birmingham, Ala.; and R. F. Gale, Midvale Steel & Ordnance Co., Philadelphia; treasurer, James Farrington, LaBelle Iron Works, Steubenville, O.; secretary, J. F. Kelly, National Tube Co., McKeesport, Pa. The report of the secretary shows that during the past year a gain of 90 active and 110 associate members was made, bringing the total membership, including firm members, up to more than 1000.

Walter Greenwood, Carnegie Steel Co., Youngstown, O., submitted the report of the safety committee which comprised safety rules for the government of employes working on electrical equipment. A. B. Holcomb, Standard Tin Plate Co., Canonsburg, Pa., presented the report of the educational committee. The necessity of training electrical employes of foreign birth, inspectors, linemen, armature winders and electrical foremen was strongly emphasized. Much attention was attracted by an exhibition of electrical apparatus. The convention will continue until Friday, Sept. 26.

The Nonferrous Metals

	‡Copper	Future Straits N. Y.*	†Lead, New York basis	Zinc St. Louis basis	Aluminum	Spot antimony	Nickel ingot
Sept. 17	23.50	54.50	6.25	7.15	33.00	8.50	41.00
Sept. 18	23.50	54.50	6.25	7.15	33.00	8.50	41.00
Sept. 19	23.50	54.00	6.25	7.15	33.00	8.50	41.00
Sept. 22	23.50	53.50	6.25	7.10	33.00	8.50	41.00
Sept. 23	23.50	52.75	6.25	7.00	33.00	8.50	41.00

* September sh'pment rom Singapore, c.i.f. New York.
† American Smelting & Refining Co.'s price.
‡ Producers' price. Outside market unchanged Sept. 17, 22.25c; Sept. 18, 22.12½c; Sept. 19, 21.75c; Sept. 22, 21.50c; Sept. 23, 21.50c; lake, 22c; casting, 21.12½c.

NEW YORK, Sept. 23.—With the steel strike hanging over the markets, activity in the nonferrous metals has been almost suspended the past week. Consumers of metals have shown little interest in their forthcoming requirements, while metal traders have been reluctant to commit themselves in any direction pending definite clue as to the extent and importance of the strike.

The small second hand holders of copper have shown weakness, with resultant shading of prices in the outside market, but the large producers and selling agencies have stood pat. The producers' prices for electrolytic copper remain at 23.50c for spot, 24.00c for October delivery. The outsiders have dropped their quotations to 21.50c for spot, 21.75c to 22.00c for fourth quarter. Casting copper is quoted 21.00c to 21.12½c and lake at 22.00c in the outside market. Copper business is extremely s'ow.

The tin market dropped about two cents a pound the past few business days. As this week opened, Straits tin or September shipment from the Straits could be bought at 53.50c, while shipment in October, November or December was quoted 53.25c, declines of about a cent. These positions now are 52.75c and 52.50c. Spot tin prices dropped under pressure of the arrival of several unsold lots from England. Spot Straits is 55.00c.

The zinc market suffered as a result of the steel labor agitation, prices dropping 15 points in two days, to 7.00c East St. Louis, for prompt and September sh'pment, 7.10c for last quarter shipment.

American Smelting & Refining Co. advanced its lead price last week to 6.25c, New York, 6.00c East St. Louis, following which action independent producers also put their prices at that level.

Strike Failing at Vital Points

Drive at Iron and Steel Industry by Radical Leaders of American Federation of Labor Falls Far Short of its Goal — Only 20 Per Cent of Workers Who are Idle are Strikers—Ninety-five Per Cent of Latter Foreigners

LATEST reports from the centers of the strike in the iron and steel industry show that the drive launched Sept. 22 by the radical leaders in the American Federation of Labor not only failed to attain its objective but has met with some serious reverses which indicate its ultimate defeat.

The strike is proving not only the most ill-advised and ill-timed of all great labor disturbances in the history of the country, but the most unAmerican and most unpopular as well. Standing out above all other features of interest to the general public is the fact that it is a strike primarily of foreigners against one of the nation's most important industries—a strike of foreigners on American soil that has thrown out of employment thousands of American workmen, whose sympathies are not with the strikers.

How long the handful of extremists in the American federation can thus withhold employment from loyal American workmen is problematical, but there are strong indications on every side that public sentiment is aroused.

Blast Furnaces are Seriously Crippled

The relatively few Americans who are members of newly organized unions are reported to be dissatisfied with the strike, while the great body of workmen forced into idleness are bitter. A conservative estimate places the proportion of those who are out of their own free will at but 20 per cent of the total number of those idle. Further, it is estimated that 95 per cent of the bona fide strikers are foreigners. The foreigners, mostly all of whom are laborers and illiterate, are keeping from work men who earn from $10 to $30 a day.

In the Pittsburgh, Wheeling and Youngstown districts the latest returns indicate that 80,000 men are out, only 16,000 of whom are organized and went out on strike. In the Pittsburgh district operations on Tuesday were much better than on Monday.

Blast furnaces were the most seriously crippled of all the industries in western Pennsylvania and through the valley, due to the preponderence of common and foreign labor employed. The number of active stacks of the Carnegie Steel Co., has been reduced from 47 to 20 since the outbreak of the strike, while 10,000 of the 52,000 men employed by the company are idle. This company, in common with other interests, declares that 95 per cent of the American workmen are loyal.

Union leaders commanded considerable strength in the Youngstown district, principally among the alien workers. It is estimated that 30,000 men are out. With the exception of the Trumbull Steel Co., and the Liberty Steel Co., in Warren, O., both companies employing 5700 men, operations in every large iron and steel plant in the Youngstown district are suspended. Work in the mills also is stopped, the members of the Amalgamated Association of Iron, Steel and Tin Workers being thrown out of employment. The members have a contract with the mills, and pledged themselves to honor it. But while their president, M. F. Tighe, a member of the American Federation of Labor, ordered them to abide by the contract, other members of that same federation were calling out men whose absence made the fulfillment of the contract impossible.

Out of 20 iron and steel plants in the Cleveland district, only those of the Empire Rolling Mill Co., the Union Rolling Mill Co., the Riverside and Lakeside plants of the Otis Steel Co., and the blast furnaces of the latter company are operating. All plants of the American Steel & Wire Co., the only subsidiary in the district of the United States Steel Corp., have suspended operations. Union estimates of 20,000 men idle are disputed by the employers, who claim the majority of those actually out are loyal workers who have been intimidated, or who are unable to work because plants are shut down.

The only plant of which there is a record wherein the members of the Amalgamated association voluntarily violated their agreement is that of the Lake Erie Nut & Bolt Co., Cleveland. Tighe threatened to revoke the charter of the local union if the men did not return.

Practically the entire iron and steel industry in the Chicago district is tied up, and the companies are not making any efforts to combat the strike. In this district strikers went the limit in their efforts to terrorize those who refused to join them. They did not succeed with other measures so much as they did in intimidating the wives of the workers. The women were told that the men would be killed if they persisted in working. Employers have called a meeting to decide combative measures on the question of shutting down all plants.

Three plants in the Buffalo district are tied up. The Lackawanna Steel Co. has suspended, the Rogers, Brown Co. has suspended, and the Donner Steel Co. has announced its decision to suspend, with 10,000 men out.

Southern Territory Not Greatly Affected

The strike has not greatly affected plants in the St. Louis district, Birmingham district, eastern Pennsylvania and New England, while all plants on the Pacific coast are operating as usual. All employes in the St. Louis district are at work, and in Alabama, the Tennessee Coal, Iron & Railroad Co., and American Steel & Wire Co., report more men were at work Tuesday than on Monday. These two companies are operating their plants in Alabama at practically the same rate as before the strike was called. No trouble has been experienced, although union organizers are making frantic appeals to the men. In the New England states, where there has been considerable labor disturbances during the past few months, all iron and steel plants are reported to be operating without trouble.

Repeated efforts have been made by officials of the unions represented in the strike to involve others, but thus far the federation as a national body has not attempted to call out organized labor in other trades. A deadlock in the iron and steel strike may cause the federation to throw its weight in favor of the strikers, although for the present it is pursuing a policy of watchful waiting, with President Gompers remaining aloof and not in any way antagonizing the wishes of President Wilson.

The miners of the country in conference in Cleveland voted to leave the matter of a sympathy strike to the officials of their union, thus postponing action on the issue

which was brought before them. In a few instances, switchmen and dock workers have quit, but the number is inconsequential. Officials of the lake seamen's union claim that the seamen's ballot on the question of a strike favored a walkout, but they must now meet and canvass the vote. From developments in the strike thus far it is apparent that the conservative leaders in the American Federation of Labor still retain control. It must be patent to them that to sanction a nation-wide strike to support the union steel workers would be to plunge the country into industrial chaos—and they have succeeded in keeping a steady hand on the helm, thus far.

The United States senate has passed a resolution providing for an investigation of the strike by a committee, and it is reported that E. H. Gary, chairman of the United States Steel Corp., will be asked to testify, together with John J. Fitzpatrick, chairman of the national committee organizing the steel workers.

Comparatively little violence has broken out in the strike districts, although some companies complain that police protection for nonunion workers has not been adequate. Resentment against the strikers has found expression in many localities. Near Pittsburgh business men and farmers at one furnace town became so aroused over the fact that foreigners interfered with the operations of a plant that they offered their own services to operate it.

PITTSBURGH: *Situation Improves as Some Men Return; Furnaces Affected Most, Due to Aliens*

PITTSBURGH, Sept 23.—The second day of the strike finds the situation in the Pittsburgh district better from the standpoint of the manufacturers than it was the first day, due to the fact that in a number of the plants workmen who stayed away on Monday returned to work Tuesday.

The National Tube Co. is practically unaffected by the strike, while the American Bridge Co. is running with its full complement at Ambridge, Pa. The Schoenberger works of the American Steel & Wire Co., have not lost a man, while among the independents, the Jones & Laughlin Steel Co., had less than 100 men quit work and is running substantially full.

More men reported for work today at the plants of the Allegheny Steel Co. and the West Penn Steel Co., at Brackenridge, Pa., which permitted those companies to increase their operations. The Cambria Steel Co., Johnstown, Pa., is down in all departments, and the word from the valley districts is to the same effect. The Pittsburgh Steel Co. is down, but the Crucible Steel Co. and the Carbon Steel Co. are operating to some extent.

Summing up the entire situation in western Pennsylvania and the valley districts, it seems that blast furnace operations have been more seriously crippled than any other branch of the iron and steel industry. This is due to the preponderance of foreign laborers at the blast furnaces. All but a few of the active merchant stacks are banked.

The Carnegie Steel Co. reports a decrease in the number of its active stacks from 47 to 20 since the inauguration of the strike. This does not mean that all of the men were either unionized or desirous of quitting. Plants of this company in the Youngstown district are affected by the presence of men from other plants who are intimidating the workers, because police protection is lacking. It is estimated that about 10,000 of the 52,000 men employed at the various plants of the Carnegie Steel Co. are idle, the bulk of them in the Youngstown district. An official statement issued by the Carnegie Steel Co., says that in every instance where men are out, they are the foreign and unskilled men. Ninety-five per cent of the American workmen remained at work. This is the experience of practically all companies.

Sheet mills are doing better than a number of other kinds of finishing mills. A number of the mills of the American Sheet & Tin Plate Co., are so isolated as to have escaped the attention of the organizers, while a number of the independents are working under agreement with the Amalgamated Association of Iron, Steel and Tin Workers, members of which are not subject to the strike call.

At least 12 of the independent mills are running with a full quota of men. A number of bar iron mills are running as a result of an agreement with the Amalgamated association, but at the skelp mills of the A. M. Byers Co., in Girard, O., common laborers at its blast furnace, and laborers of the Brier Hill Steel Co., which supplies the Byers company with some of its iron, went out. This left the puddlers without iron supplies, the latter being obliged to quit, although willing to work. The Lockhart Iron & Steel Co. and Brown & Co., Pittsburgh, makers of bar iron, are unhampered.

Roughly estimated, about 80,000 men are idle in the Pittsburgh, Wheeling and Youngstown districts. How many of these are striking is a question, but it is not believed they constitute more than 20 per cent.

YOUNGSTOWN: *All Iron and Steel Plants Suspended Except Two in Warren; 30,000 Idle*

YOUNGSTOWN, O., Sept. 23.—With the single exception of the Trumbull Steel Co., and the Liberty Steel Co., at Warren, both employing 5700 men, operations in every important iron and steel mill in the Youngstown district were completely stopped Tuesday. The Warren concerns have contracts with the Amalgamated Association of Iron, Steel and Tin Workers, but have not recognized any of the other unions concerned in the present walkout. Continuation of this policy is expected to result in the closing down of the Trumbull and Liberty plants through a strike of common laborers and other employes not of the Amalgamated association.

The strikers in the Youngstown district are largely made up of foreigners and common laborers, with union electricians and machinists joining in the walkout. Skilled mechanics and members of the Amalgamated association were thrown out of work because of the insufficiency of other labor to keep plants operating. Some of the Youngstown fabricating plants were affected by the strike Monday. The unions, however, urged the men to return to work and operations there were normal today.

Nearly 30,000 men are idle in this district, about 20,000 having struck, the others being compelled to stay

away because of intimidation and because work could not be provided. The following plants with the number of men out in each one were reported late Monday:

The Brier Hill Steel Co., Youngstown, O., completely down, 3400 men out. The Empire and Thomas works of the Brier Hill at Niles down, 1100 men. The Western Reserve works of the Brier Hill at Warren, 500 men, down.

Republic Iron & Steel Co., at Youngstown, completely down. With the exception of a few hundred men around the plant doing guard duty and performing other work, the Deforest Sheet & Tin Plate Co., at Niles, a Republic subsidiary, 700 men, completely down.

The Ohio works of the Carnegie Steel Co. are down and the blast furnaces banked; 8000 men out.

Sharon Steel Hoop Co., Hazelton and Lowellville works, 1400 men, down.

Struthers Furnace Co., 150 men, furnace banked.

The A. M. Byers Co., Girard, 1100 men, closed.

Mahoning Iron & Steel, Mineral Ridge, 500 men, closed.

The Youngstown Sheet & Tube Co., 11000, not operating at all.

Ohio Iron & Steel Co., at Lowellville, 230 men, closed.

All the companies that have contracts with the Amalgamated association report that the members of this union were anxious to work but that the plants were crippled to such an extent by the walkout of others that it was impossible for them to keep at work.

The Mahoning Valley Steel Co., at Niles, employing 700 men, is operating, as it has an Amalgamated contract.

CHICAGO: *Practically Entire Iron and Steel Industry Tied Up*

CHICAGO, Sept. 23.—The strike has largely tied up iron and steel production in the Chicago district. The United States Steel Corp. subsidiaries and the larger independent producers are not yet adopting aggressive measures to fight the strike, although families of the men who are working are being intimidated by the strikers. The Illinois Steel Co. is blowing four stacks each at Gary and South Chicago, but the finishing mills are idle. The Inland Steel Co. and the Steel & Tube Co. of America and the Wisconsin Steel Co. have banked all their blast furnaces. The American Steel & Wire Co. plants in Joliet, Waukegan, and others are practically closed. The smaller mills in South Chicago, including the Hubbard Steel Co., the Pollak Steel Co. and the Riverdale Iron & Steel Co. have been closed. The Federal Furnace Co. has been blown out and the only active stack of the Iroqois Iron Co. has been banked. The Interstate Iron & Steel Co.'s plants are running by agreement with the union. The Inland Steel Co.'s rerolling plant in Chicago Heights, Republic Iron & Steel Co.'s mills at Moline and East Chicago, also are unaffected, under the agreement with the Amalgamated association. The By-Products Coke Corp. plant is idle which will affect the foundries when stocks are gone.

The Inland Steel Co. had at work Monday morning 60 per cent of its first shift, but intimidation of their wives by the strikers caused the men to quit. A large number of the men are willing to work if protection is furnished the families, and in a conference today all employers were to decide what course to pursue, and they may shut down all plants. It is impossible to estimate the exact number of men striking, since so many are absent from work.

NEW ENGLAND: *All Workers are Loyal*

WORCESTER, Mass., Sept. 23.—New England is free of labor trouble in the steel industry and is expected to remain so regardless of the length of the general strike. The American Steel & Wire Co. is the largest producer, employing 5500 men in its three Worcester works and about 500 in its New Haven, Conn., works. Not a man was missing at any of the works Monday or Tuesday. The employes do not belong to unions and are not likely to be organized.

The Clinton Wright Wire Co., with four plants in Worcester, and one each in Spencer and Palmer, Mass., employing more than 2000 men, is free of trouble. About 200 employes of the Wright wire division of the Clinton Wright company are members of the recently organized wire workers' union, which has voted not to strike. No trouble is reported in any other part of New England.

Officials of the American Steel & Wire Co. say works in the Worcester district are running to capacity, and cannot take additional work from other plants affected by the strike, because they are booked ahead for many months.

Ore Shipments May be Stopped by Strike

Cleveland, Sept. 23.—Ore companies have been informed that the railroad administration is considering the advisability of declaring an embargo on the shipment of ore from lower lake docks to those furnaces which have been forced to suspend operations. Officials of the administration say that it is useless to tie up cars by sending them to furnaces which cannot unload them, much less consume the ore. If the embargo is declared, and if shipments from upper lakes districts continue at their present rate, ore companies say that all storage space at lower lake ports will be filled within two or three weeks. Such a situation would force the suspension of shipments and dam up the ore at the mines, regardless of what action the lake seamen may take in regard to a sympathy strike.

Union seamen on ore boats have completed balloting on the question of striking and their officers claim that the vote was almost unanimous in favor of a strike. The union's executive board is to meet at Detroit or Chicago to canvass the vote, the date for the meeting not being announced. It was reported last week that the lake seamen had decided to strike and present new demands, but action is being deferred until the leaders estimate the strength of the strike in the iron and steel industry. In the meantime, some disaffection is apparent on some of the docks at receiving ports. Unloading plants at South Chicago and Indiana harbor are reported idle, while at Gary, Ind., only two rigs are said to be in operation. The dock of the Cleveland Furnace Co. was idle on Monday, as were two docks at Buffalo which were forced to suspend operations because power furnished by steel plants was cut off.

The prospect of the forced suspension of shipments is said to be having some influence against a strike of the lake seamen. During the strike of workers on the ore docks the seamen, though idle, received full pay, and they would receive pay if forced into another period of idleness. They cannot help the iron and steel strikers

to any great extent by striking, but they can make a "sympathy" strike the occasion for pressing their own demands.

Ore companies have taken every possible means of getting their ore through to the furnaces ever since the strike in the iron and steel industry was threatened. Many furnaces are well supplied, and particularly those of the United States Steel Corp. While ore companies were insistently pointing out to independent furnace interests early in the season the desirability of getting in supplies, the Steel corporation was shipping from 60 to 80 per cent of the total tonnage brought down. Its shipments up to Sept. 1 averaged 58 per cent, approximately 17,171,000 tons.

CLEVELAND: *Amalgamated Men Violate Contract*

CLEVELAND, Sept. 23.—Conditions in the Cleveland district were not greatly changed Tuesday from the first day of the strike, although union leaders claimed that the total number of men out increased from 18,000 to 25,000. This was denied by company officials, who stated that developments were in their favor. Actual strikers, mill owners contend, do not number more than 40 per cent of those out, the others being forced into idleness. Out of the 20 plants in Cleveland, only those of the Empire Rolling Mill Co., the Union Rolling Mill Co., the Riverside and Lakeside plants and the two blast furnaces of the Otis Steel Co., are operating. The two former companies have agreements with the Amalgamated Association of Iron, Steel and Tin Workers.

Tuesday it developed that workmen at the plant of the Lake Erie Nut & Bolt Co. had walked out against the orders of the Amalgamated association, of which they are members, and with which the company has an agreement. This action evoked a threat from their president, M. F. Tighe, that unless the men returned to work the local's charter would be revoked. Despite this, the men have not returned to work.

All plants of the American Steel & Wire Co., the only subsidiary in this district of the United States Steel Corp., are closed. The plant of the McKinney Steel Co., the largest independent producer in the district also is closed, including the furnace, open hearth department and mills. Operations have been suspended at the plant of the Cleveland Steel Co., and the plant of the Upson Nut Co.

Officials of the various companies state that the majority of workmen allied with the union are foreigners and that practically all native American workmen are anxious to work, but are restrained through fear of bodily injury. That the zeal of the strikers is waning is shown by the falling off in the number of men attending various rallies. Fifteen thousand foreigners attended a rally Monday, but at a meeting Tuesday only 3000 workmen turned out.

BUFFALO: *Three Plants Tied Up; 10,000 Men Reported Out*

BUFFALO, Sept. 23.—Steel workers succeeded this morning in tying up the three plants in which a strike had been called. Over 10,000 or 95 per cent of the working force of these plants are on strike.

The Lackawanna Steel Co. suspended operations today. Less than one-quarter of their employes reported for work Monday morning and the Monday night and Tuesday morning shifts were so depleted as to preclude operation. The Lackawanna company employed 7500 men. The Donner Steel Co. of Buffalo is to suspend operations tonight or tomorrow. The company employs 2500 men. Up to noon today the two furnaces of the Donner company at Tonawanda, N. Y., were not affected. The Rogers-Brown Co. was forced to shut down Monday when 500 men, its entire working force, went on strike. No strike has yet been called at any of the other steel plants in this district.

W. H. Donner, president of the Donner Steel Co., said hundreds of his men would have reported for work, but for intimidation by strikers.

BIRMINGHAM: *Men Return; Plants Active*

BIRMINGHAM, Ala., Sept. 23.—The strike of iron and steel workers in the Birmingham district has been a failure. All plants of the Tennessee Coal, Iron & Railroad Co., and the American Steel & Wire Co., subsidiaries of the United States Steel Corp., are operating. Two departments in the wire plant suffered a little hindrance Monday. A conservative estimate for the four plants here, which employ under normal conditions upward of 7000 to 10,000 men, is that less than 500 went out on strike Monday and many of them were foreigners. Early Tuesday morning the foreigners began seeking reinstatement, claiming to have been misinformed as to the strike. More men were working Tuesday than on Monday. Not the least disorder was reported about the works here, and Chief of Police Shirley reduced his forces materially on the second day of the strike. Steel rails left the Ensley plant today enroute to San Francisco and Japan. Ingots were shipped Monday as usual to the Fairfield wire mill, to Bessemer, for the rolling mill, and to Westfield for the new fabricating works.

PHILADELPHIA: *Few Plants Affected*

PHILADELPHIA, Sept 23.—Although eastern steel plants are not yet affected much by the strike, the opinion prevails here that they will not escape. In fact, eastern producers gard the present situation holds possibilities for a tieup of the industry. However, they believe the strike must be fought to a finish, as a victory by labor unions would pave the way to an ultimate industrial cataclysm. Much fault is found with the daily newspapers, which evidently do not appreciate the real factors involved in the strike.

Practically the only mills affected in the East were those at Coatesville where on Monday 1200 men were out at the Midvale Iron & Steel Co.'s plant, and several hundred at the Lukens Iron Co.'s plant. The strikers were later replaced.

Philadelphia, Birthplace of A. F. A., Welcomes Foundrymen

Independence Hall
The Home of the Liberty Bell

FOR five days beginning Monday, Sept. 29, Philadelphia, the birthplace of American independence and the home of the first convention of the American Foundrymen's association, will for the third time entertain the foundrymen of the United States, Canada and abroad. As heretofore, the convention this year will include the annual meeting of the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers. It is especially fitting that the twenty-fourth annual meeting of foundrymen, the first in five years to be held in time of peace, is to take place in the city founded by William Penn, America's first well-known advocate of peace. The spirit of war, which so thoroughly entered into the activities of the last five annual meetings, will be noticeably absent this year. Especially striking will be the contrast between the Philadelphia and Milwaukee conventions. Last year, in the midwestern city, the enthusiasm of the 4000 foundrymen in attendance was focused exclusively on the work of winning the war; during the week of Sept. 29, the interest of foundrymen will be centered upon the problems of reconstruction.

Evidence of many developments peculiar to the present era will be reflected in this year's convention. In keeping with the tendency toward closer international relations, the Philadelphia meeting will be marked by a distinctive cosmopolitan aspect to a degree never before approached. In view of this development, the meeting has been named the Inter-Allied Foundrymen's Convention and Exhibition. The return of peace is permitting foundrymen to direct their efforts along lines neglected during the war. Striking proof of this is found in the space requirements of exhibitors who have demanded more than 60,000 square feet, an increase of 43 per cent over any previous show. The removal of the restraint of war also will be reflected in the program of technical papers. A special session on industrial relations has been arranged in order that the broad aspects of that problem, which are absorbing so much attention at this time, may be intelligently discussed. The consideration of reconstruction questions also will hold a prominent place in the program of technical papers to be presented before the American Foundrymen's association at sessions on steel, malleable, gray-iron and general foundry practice, and in the dozen or more papers to be presented at sessions of the Institute of Metals division of the American Institute of Mining and Metallurgical Engineers. The 1919 annual meeting promises to outclass all previous conventiohs in every respect, and will emphasize, as never before, the tremendous growth of the association since its first annual meeting in the Quaker city, 23 years ago. Although the opening sessions of the convention are scheduled for Tuesday morning, the registration office in the assembly room, Commercial Museum, will open Monday morning, Sept. 29, at 10 o'clock.

Condensed Program

Monday, Sept. 29

10:00 A. M.—Registration, Philadelphia Commercial Museum.

10:00 A. M.—Opening of exhibition, Philadelphia Commercial Museum.

Tuesday, Sept. 30

10:00 A. M.—Joint session, American Foundrymen's association and Institute of Metals division of the American Institute of Mining and Metallurgical Engineers, ball room, Bellevue-Stratford hotel.

2:30 P. M.—Opening session, Institute of Metals division, American Institute of Mining and Metallurgical Engineers, Ritz-Carlton hotel.

Afternoon—Boat ride on the Delaware river, terminating with a visit to the Hog Island shipyard.

Wednesday, Oct. 1

10:00 A. M.—Professional session, American Foundrymen's association, ball room, Bellevue-Stratford hotel, for the discussion of general topics.

10:00 A. M.—Steel session, American Foundrymen's association, clover room, Bellevue-Stratford hotel.

10:00 A. M.—Professional session, Institute of Metals division of American Institute of Mining and Metallurgical Engineers, Ritz-Carlton hotel.

11:00 A. M.—Automobile trip for the ladies through Fairmount park to Valley Forge, where luncheon will be served.

2:00 P. M.—Golf tournament, Whitemarsh Valley Golf club.

8:00 P. M.—Theater party for ladies and gentlemen at Keith's.

Thursday, Oct. 2

10:00 A. M.—Gray iron session, American Foundrymen's association, ball room, Bellevue-Stratford hotel.

10:00 A. M.—Malleable iron session, American Foundrymen's association, clover room, Bellevue-Stratford hotel.

10:00 A. M.—Industrial relations session, American Foundrymen's association, red room, Bellevue-Stratford hotel.

10:00 A. M.—Professional session, Institute of Metals division, American Institute of Mining and Metallurgical Engineers, Ritz-Carlton hotel.

1:30 P. M.—For the ladies, a visit to Wanamaker's store, plant of the Curtis Publishing Co., Independence hall, and other points of interest in Philadelphia.

7:00 P. M.—Annual banquet, Bellevue-Stratford hotel, followed by dancing.

Friday, Oct. 3

10:00 A. M.—Professional session, American Foundrymen's association, ball room, Bellevue-Stratford hotel.

Program, American Foundrymen's Association

Monday, Sept. 29

10:00 A. M.—Registration, Philadelphia Commercial Museum.

10:00 A. M.—Opening of exhibition, Philadelphia Commercial Museum.

Tuesday, Sept. 30

10:00 A. M.—Joint opening session, American Foundrymen's association and Institute of Metals Division, American Institute of Mining and Metallurgical Engineers, Ball room, Bellevue-Stratford hotel.

Address of welcome, by Thomas Devlin, Thomas Devlin Mfg. Co., Philadelphia.

Response to the address of welcome, by A. O. Backert, president of the American Foundrymen's association.

Report of secretary-treasurer, American Foundrymen's association, Inc.

Report of board of directors, American Foundrymen's association, Inc.

Annual address by A. O. Backert, president, American Foundrymen's association.

"Considerations Affecting Brass Melting in Gray Iron Shops," by Russell R. Clarke, Eagle Brass Foundry, Seattle, Wash.

"The Weeks Electric Rotating Furnace as Applied to the Brass Foundry Industry," by F. J. Ryan, American Metallurgical Corp., Philadelphia.

"The Need for Co-operative Research in Alloys," by H. E. Howe, National Research Council, Washington, D. C.

Report of the American Foundrymen's association committee on foundry costs, by J. Roy Tanner, chairman, Pittsburgh Valve Foundry & Construction Co., Pittsburgh.

"Publicity Work of Foundry Equipment Manufacturers' Association," by Franklin G. Smith, chairman, publicity committee, Foundry Equipment Manufacturers' association, Cleveland Osborn Mfg. Co., Cleveland.

Appointment of nominating committee and committee on resolutions.

1:30 P. M.—Boat ride on the Delaware river, terminating with a visit to the Hog Island shipyard.

Wednesday, Oct. 1

General Topics

10:00 A. M.—Professional session, American Foundrymen's Association, Ball room, Bellevue-Stratford hotel.

"Audible Signals in Foundries," by Prof. Vladimir Karapetoff, Ithaca, N. Y.

"How to Secure Best Results in Combining Hoisting Apparatus with Molding Machines," by W. C. Briggs, Shepard Electric Crane & Hoist Co., New York.

"Foundry Sand-Handling Equipment," by H. L. McKinnon, The C. O. Bartlett & Snow Co., Cleveland.

"Concrete Foundry Molding Floors," by H. H. Haley, American Foundry Equipment Co., New York.

"The Care of Foundry Equipment," by G. L. Grimes, Grimes Molding Machine Co., Detroit, Mich.

"Uniform Methods of Cost Accounting," by C. E. Knoeppel, C. E. Knoeppel & Co., New York.

Report of the nominating committee and election of directors of the American Foundrymen's association, Inc.

Steel Session

10:00 A. M.—Professional session, American Foundrymen's association, Clover room, Bellevue-Stratford hotel.

"Electric Versus Converter Steel," by John Howe Hall and G. R. Hanks, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.

"Effect of Sulphur in Steel Castings," by Professor A. E. White, University of Michigan, Ann Arbor, Mich.

"Repairing Castings on Transport Northern Pacific," by Arthur F. Braid, Metal & Thermit Corp., New York.

"Comparison of Costs of Electric and Open Hearth Furnace Practice," by E. H. Ballard, West Lynn, Mass.

Report of the American Foundrymen's Association Committee on Steel Foundry Standards, by W. A. Janssen, chairman, American Steel Foundries, Chicago.

"Operation of the Acid Electric Furnace," by L. B. Lindemuth, Carney & Lindemuth, New York.

"Values of the Present Methods of Measuring the Temperature of Molten Steel," by F. W. Brooke, Electric Furnace Construction Co., Philadelphia.

Entertainment Features

11:00 A. M.—Automobile trip for the ladies through Fairmount park to Valley Forge, where luncheon will be served.

2:00 P. M.—Golf Tournament, Whitemarsh Valley Golf club.

8:00 P. M.—Theater party for ladies and gentlemen at Keith's.

Thursday, Oct. 2

Gray Iron Session

10:00 A. M.—Professional session, American Foundrymen's association, Ball room, Bellevue-Stratford hotel.

"The Elimination of Strains in Iron Castings," by C. J. Wiltshire, General Electric Co., Schenectady, N. Y.

"The Value of a Scrap Pile," by Henry Traphagen, Toledo Steel Castings Co., Toledo, O.

"The Electric Furnace as an Adjunct to the Cupola," by George K. Elliott, Lunkenheimer Co., Cincinnati.

Report of the American Foundrymen's Association Committee on General Specifications for Gray Iron Castings, Dr. Richard Moldenke, Watchung, N. J.

"Side Blow Converter in Iron Foundry," by George P. Fisher, Whiting Foundry Equipment Co., Harvey, Ill.

"The Testing of Clays for Foundry Use," by Homer F. Staley, Bureau of Standards, Washington.

"Cerium in Cast Iron," by Dr. Richard Moldenke, Watchung, N. J.

Malleable Session

10:00 A. M.—Professional session, American Foundrymen's association, Clover room, Bellevue-Stratford hotel.

"Burning Fuel Oil in an Air Furnace," by J. P. Pero, Missouri Malleable Iron Co., E. St. Louis, Ill.

"The Application of Powdered Coal to Malleable Annealing Furnaces," by Charles Longenecker, The Bonnot Co., Pittsburgh.

"Efficient Use of Pulverized Coal in Malleable Foundry Practice," by Milton W. Arrowood, Ground Coal Engineering Co., Chicago.

"Powdered Coal as a Fuel in the Foundry," by H. A. Grindle, Combustion Economy Corp., Chicago.

"Relation Between Machining Qualities of Malleable Castings and Physical Tests," by Edwin K. Smith and William Barr, Wisconsin Malleable Iron Co., Milwaukee.

"The Refining of Cupola Malleable in the Electric Furnace," by A. W. Merrick, General Electric Co., Schenectady, N. Y.

Report of the American Foundrymen's Association Committee on Specifications for Malleable Castings, by Enrique Touceda, chairman, Albany, N. Y.

"Some Needs of the Malleable Iron Industry," by W. P. Putnam, Detroit Testing Laboratory, Detroit.

"A Note on Britain's Experimental Foundry," by G. Ernest Wells, Edgar Allen & Co., Sheffield, England.

"Galvanizing Malleable Castings," by Prof. Enrique Touceda, Albany, N. Y.

"Effects of Annealing Gray and Malleable Iron Bars in Copper Oxide Packing," H. E. Diller, THE FOUNDRY, Cleveland.

Industrial Relations Session

10:00 A. M.—Professional session, American Foundrymen's association, Red room, Bellevue-Stratford hotel.

"Training Men for Foundry Work," by C. C. Schoen, U. S. Dept. of Labor, Stamford, Conn.

"Personnel Problems of Modern Industry," by C. D. Dyer Jr., Hunt & Dyer, Philadelphia.

"Industrial Democracy and The Foreman," by John Calder, Business Training Corp., New York.

Report of the American Foundrymen's Association Committee on Safety, Sanitation and Fire Protection, by Victor T. Noonan, U. S. Mutual Liability Insurance Co., Quincy, Mass.

"Vocational Training for Foundry Occupations," by J. C. Wright, Federal Board for Vocational Education, Washington.

Entertainment Features

1:30 P. M.—For the ladies, visit to Wanamaker's store, plant of the Curtis Publishing Co., Independence hall, and other points of interest.

7:00 P. M.—Annual banquet, Bellevue-Stratford hotel, followed by dancing.

Friday, Oct. 3

General Topics

10:00 A. M.—Professional session, American Foundrymen's association, Ball room, Bellevue-Stratford hotel.

"The Economical Control and Handling of Patterns in a Large Foundry," by W. D. Jones, Canton Steel Foundry Co., Canton, O.

"Progress in the Application of Electric Arc Welding," by Robert E. Kinkead, Lincoln Electric Co., Cleveland.

"A New Cutting Gas," by Professor Alfred S. Kinsey, Stevens Institute of Technology, Hoboken, N. J.

"Welding Castings of Different Metals and Different Sections," by George B. Malone, Bayonne Steel Casting Co., Bayonne, N. J.

Report of the American Foundrymen's Association Committee Advisory to the United States Bureau of Standards, by Dr. Richard Moldenke, Watchung, N. J.

Report of American Foundrymen's Association Committee on Promotion and Membership, by A. E. Howell, chairman, Nashville, Tenn.

"High Temperature Cement for Lining Cupolas, etc.," by W. S. Quigley, Quigley Furnace Specialties Co., New York.

Installation of officers.

Departing from the precedent set in previous years, the exhibition of foundry, machine shop and rolling mill equipment in the Commercial Museum will open at 10 o'clock a. m., somewhat earlier than usual. Also the exhibition will be open Tuesday evening. The formal opening of the convention will take place in the ball room of the Bellevue-Stratford hotel, Tuesday morning, at 10 o'clock, when members of the American Foundrymen's association and Institute of Metals division of the American Institute of Mining and Metallurgical Engineers will convene in a joint session. The address of welcome, annual address of the president of the American Foundrymen's association, and reports of the board of directors and the officers of the organization will be presented at this session, together with papers on brass foundry practice. The first professional session of the Institute of Metals division will be held at 2:30 p. m., Tuesday, in the Ritz-Carlton hotel, and will be followed by two other sessions in the same hotel at 10 a. m., Wednesday and Thursday mornings. Condensed and detailed programs of both organizations appear elsewhere in this issue. The technical papers prepared for the American Foundrymen's association cover a wide range of subjects of unusual interest to foundrymen. Eleven distinct subjects are treated in the papers on miscellaneous subjects scheduled for presentation at the three sessions devoted to general topics. The authors of these papers will touch upon publicity work, the use of audible signals in foundries, combining hoisting apparatus with molding machines to good advantage, sand handling equipment, concrete floors for foundries, the care of foundry equipment, uniform methods of foundry cost accounting, scientific management as applied to foundries, handling patterns in a large foundry, various problems of welding castings by the electric arc and gas processes, and the use of high temperature cement for lining cupolas. Six papers will be presented at the steel session to be held Wednesday morning. "Electric versus Converter Steel" is the subject of a paper to be presented by John Howe Hall and G. R. Hanks. E. H. Ballard will compare the costs of electric and open-hearth furnace practice. Moving pictures showing the welding of a large steel casting on the transport NORTHERN PACIFIC, which went aground off Fire island in January, will accompany a paper on that subject to be presented by Arthur F. Braid. W. A. Janssen, chairman of the committee on steel foundry standards, will submit the report of that committee. Among the subjects to be discussed in the six papers scheduled for the gray-iron sessions to be held Thursday morning are, "The Elimination of Strains in Cast Iron," by C. J. Wiltshire; "The Testing of Clays for Foundry Use," by Homer F. Staley; and "The Electric Furnace as an Adjunct to the Cupola," by George K. Elliott. The use of powdered coal in malleable practice will be discussed in three of the 10 papers to be presented at the malleable iron session to be held Thursday morning simultaneously with the sessions on gray-iron and industrial relations. A paper entitled, "A Note on Britain's Experimental Foundry," by G. Ernest Wells, Edgar Allen & Co., Sheffield, England, who was in the British ministry of munitions, is expected to prove of unusual interest to American foundrymen who have not had frequent opportunities to obtain first-hand information on English foundry practice. Prof. Enrique Touceda will discuss malleable castings and H. E. Diller will outline the results of annealing gray and mal-

Carpenters' Hall
Where Continental Congress First Met

Program, Institute of Metals Division, A. I. M. M. E.

Monday, Sept. 29

10:00 A. M.—Registration, Ritz Carlton hotel.

10:00 A. M.—Opening of exhibit, Philadelphia Commercial Museum.

7:00 P. M.—Meeting and dinner of the executive committee.

Tuesday, Sept. 30

10:00 A. M.—Joint opening session, American Foundrymen's association and Institute of Metals Division, American Institute of Mining and Metallurgical Engineers, ball room, Bellevue-Stratford hotel. A. O. Backert, chairman, president American Foundrymen's association. (See American Foundrymen's program for details.)

2:30 P. M.—Professional session, Institute of Metals Division, Ritz-Carlton hotel.

Physical Properties of Nickel, by David H. Browne and J. F. Thompson.

Some properties and Applications of Rolled Zinc Strip and Drawn Zinc Rod, by C. H. Mathewson, C. S. Trewin and W. H. Finkeldey.

Afternoon—Boat ride on the Delaware river, terminating with a visit to the Hog Island shipyard.

Wednesday, Oct. 1

10:00 A. M.—Professional session, Institute of Metals Division, Ritz-Carlton hotel.

Fire Foundry Tests of Zinc Bronzes, by C. P. Karr.

Influence of Heat Treatment on Gun Metal, by C. F. Smart.

Lead Zinc Bronzes, by H. F. Staley and C. P. Karr.

Manufacture and Electrical Properties of Manganin, by F. E. Bash.

Manufacture and Electrical Properties of Constantan, by F. E. Bash.

Tin Fusible Boiler Plug Manufacture and Testing, by L. J. Gurevich and J. S. Hromatko.

Simplification of Inverse-rate Method for Thermal Analysis, by P. D. Merica.

11:00 A. M.—Automobile trip for the ladies through Fairmount park to Valley Forge, where luncheon will be served.

2:00 P. M.—Golf tournament, Whitemarsh Valley Golf club.

8:00 P. M.—Theater party for ladies and gentlemen at Keith's.

Thursday, Oct. 2

10:00 A. M.—Professional session, Institute of Metals Division, Ritz-Carlton hotel.

Constitution and Metallography of Aluminum and Its Light Alloys with Copper and with Magnesium, by P. D. Merica, R. G. Waltenberg and J. R. Freeman Jr.

Heat Treatment and Constitution of Duralumin, by P. D. Merica, R. G. Waltenberg and H. Scott.

Heat Treatment of Aluminum Alloy Castings, by Zay Jeffries and W. A. Gibson.

Mechanical Properties and Resistance to Corrosion of Rolled Light Alloys of Aluminum and Magnesium with Copper, with Nickel and with Manganese, by P. D. Merica, R. G. Waltenberg and A. N. Finn.

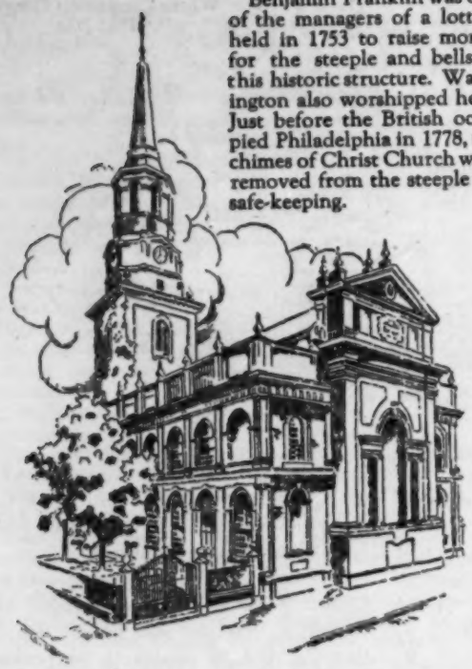
Deterioration of Nickel Spark-plug Terminals in Service, by H. S. Rawdon and A. I. Krynitzky.

Grain Growth in Alpha Brass, by F. G. Smith.

1:30 P. M.—For the ladies, a visit to Wanamaker's store, plant of the Curtis Publishing Co., Independence hall, and other points of interest in Philadelphia.

7:00 p. m.—Annual banquet, Bellevue-Stratford hotel, followed by dancing.

Old Christ Church



Benjamin Franklin was one of the managers of a lottery held in 1753 to raise money for the steeple and bells of this historic structure. Washington also worshipped here. Just before the British occupied Philadelphia in 1778, the chimes of Christ Church were removed from the steeple for safe-keeping.

leable-iron bars in copper-oxide packing.

It is expected that an unusual amount of interest will be attracted by the session devoted to industrial relations to be held in the Red room of the Bellevue-Stratford hotel Thursday morning. The training of men for foundry work will receive considerable attention, the subject being introduced in papers to be presented by C. C. Schoen and J. C. Wright, who have had experience in dealing with this problem as members of federal boards of investigation. C. D. Dyer, Jr., will present a paper on personnel problems of modern industry and John Calder will discuss the role of the foreman in the plan of industrial democracy. The report of the committee on safety, sanitation and fire prevention will be submitted by Victor T. Noonan, chairman of that committee and a paper entitled "Safety Appliances and Welfare Work in Foundries" will be presented.

Two of the 15 technical papers on the program of the Institute of Metals division are scheduled for the opening professional session to be held at 2:30 p. m. Tuesday in the Ritz-Carlton hotel. David H. Browne and J. F. Thompson will present a paper on the properties of nickel. "Some Properties of and Applications of Rolled Zinc Strip and Drawn Zinc Rod" is the title of a paper prepared by C. H. Mathewson, C. S. Trewin and W. H. Finkeldey. At Wednesday morning's session C. P. Karr and H. F. Staley will present two papers dealing with zinc bronzes and the manufacture and electrical properties of manganin and constantin will be discussed in two papers by F. E. Bash. The subject in four of the six papers scheduled for the Thursday morning session. The other papers to be presented at this session deal with the deterioration of nickel spark-plug terminals and the grain growth in alpha brass.

The Inter-Allied Foundrymen's exhibition to be held in the Philadelphia Commercial Museum will far surpass anything ever attempted by any organization in the United States. The 60,000 square feet of floor space available in this hall, although 43 per cent in excess of any previous exhibit, has proved inadequate for the requirement of the manufacturers desiring to display equipment. In view of the extraordinary demands for space, the manager of exhibits was obliged to restrict the amount of space alloted to each exhibitor. On Sept. 8, three weeks before the opening of the convention, more than 200 manufacturers of foundry, machine shop and metal working equipment had signed contracts for space in the building. The 1919 exhibition will be different in many respects from those of the past five years. Many manufacturers of foundry equipment who, because of the pressure of war, were not able to participate in recent exhibits, will be represented at this year's show. More than 80 exhibitors who were not represented at Milwaukee last year will display equipment at Philadelphia. This year's show will be marked by an unusually large number of working exhibits, especially those consisting of machine tools and molding machines.

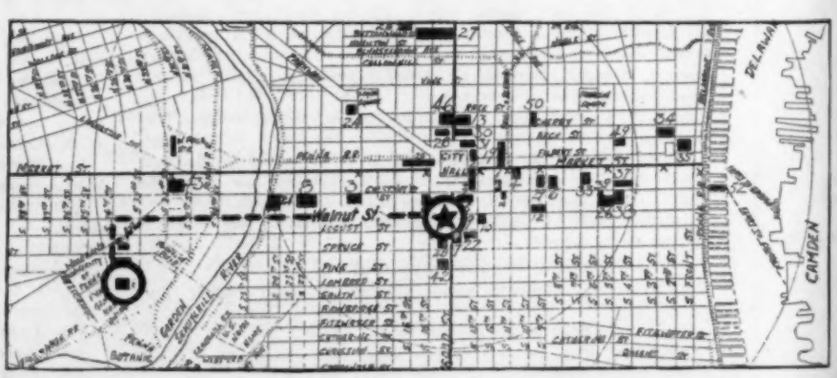
In recognition of and to commemorate the convention, the International Shipbuilding Corp. has arranged to launch a ship at the Hog Island yard on Tuesday afternoon, Sept. 30. This ship will be named AFOUNDRIA in honor of the American Foundrymen's association and the great industry which this organization represents. The AFOUNDRIA will be christened by Mrs. A. O. Backert, wife of the president of the association. The launching of the AFOUNDRIA will be one of the features of the boat ride on the Delaware river. The boat will leave the Chestnut street wharf at 1:30 p. m. The name of the ship AFOUNDRIA was coined from the first letters of the name of the association, namely, A. F. A. and the word "foundry."

Wednesday morning promptly at 11 o'clock the ladies will be taken on an automobile trip through Fairmount park to Valley Forge where luncheon will be served. A golf tournament will be held Wednesday afternoon at the Whitemarsh Valley Golf club and at 8:15 p. m. a theater party will be given for ladies and gentlemen at Keith's. Thursday afternoon the ladies will be given an opportunity to visit Wanamaker's store, the plant of the Curtis Publishing Co., Independence hall, and other points of interest in the city.

Speakers from both sides of the Atlantic will appear at the annual banquet which will be held at the Bellevue-Stratford hotel Tuesday evening, Oct. 2. The program includes Hon. James M. Beck, one of the foremost orators in the country, and Sir Ellis W. Hume-Williams, a distinguished citizen of Great Britain. Dancing will follow the banquet.

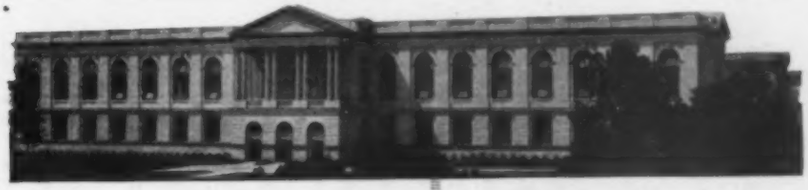
Special arrangements will be made during the week for visiting foundrymen who desire to inspect industrial plants in Philadelphia and vicinity.

How to Find Your Way in The



The Bellevue-Stratford and Ritz-Carlton hotels, where the A. F. A. and Institute of Metals division will hold their meetings are situated on opposite sides of Broad street at the intersection of Walnut street. This is shown on the map by the star within a circle. The Philadelphia Commercial Museum, where

1919 Show Will Surpass All Previous Exhibitions



The Exhibition opens Monday, Sept. 29, at 10:00 a. m. It is Open Daily from 9:00 a. m. to 5:00 p. m. until 5:00 p. m. Friday, Oct. 3. The Floor Space Devoted to Exhibits is 60,000 Square Feet. Many New Exhibitors Have Reserved Space.

ABRASIVE CO., Philadelphia.—This company will exhibit abrasive wheels, bricks and sticks. Grinding wheels of a carbide of silicon abrasive and wheels of an aluminous abrasive will be shown. Basic materials of interest to foundrymen will be exhibited; represented by J. H. Byers and R. R. Stagmer.

ACHESON GRAPHITE CO., Niagara Falls, N. Y.—This exhibit will consist of threaded electric furnace products including skimmers' and cutting and welding electrodes; represented by Acheson Smith, Lyman C. Judson and Atwood Boatman.

AIR REDUCTION SALES CO., New York.—A complete line of welding and cutting apparatus, including oxygen and acetylene, and acetylene generators, will be exhibited; represented by E. L. Mills, A. S. Kinsey, E. M. Sexton, L. A. Sholes, A. R. Ludlow, A. D. Frost, W. P. Roberts, H. F. Weldin, D. Sinclair, B. N. Law and G. Walker.

AJAX METAL CO., Philalelphia.—This company will exhibit an Ajax-Wyatt electric furnace and a group of yellow brass ingots made in this furnace. The ingots have a depression on each side so that tongs will grip them securely. A series of ingots made to different formulas and a variety of castings made from similar ingots will be displayed. Babbitt metals of all kinds will be shown; represented by G. H. Clamer, Frank M. Willeson, A. MacDougall, Louis E. Purnell, John G. Miller, J. M. Graham, S. E. McClure, J. C. Brightbill, C. E. Hopkins, James R. Wyatt and William J. Coane.

AMERICAN GUM PRODUCTS CO., New York.—Cores made with the binder manufactured by this company and castings produced by the use of these cores will be exhibited; represented by Gordon I. Lindsay, W. Edward Baird, M. F. Coughlin, C. F. Witters and F. B. Thomas.

AMERICAN KRON SCALE CO., New York.—The automatic springless dial scale for foundries made by this company will be demonstrated; represented by G. H. Harper, Arnold Peterson and J. J. Kelly.

AMERICAN MANGANESE BRONZE CO., Philadelphia—A 100,000-pound capacity electrically driven Olsen testing machine will be shown in operation. Exhibitors are invited to bring test pieces to have them tested free of charge. The company also will exhibit manganese bronze ingots and intricate castings made from these ingots; represented by C. R. Spare, T. H. Addie, C. E. Schley and C. J. Bower.

AMERICAN OIL & SUPPLY CO., Newark, N. J.—Cores made with the core oil manufactured by this company will be exhibited; represented by E. F. Hoffmann, W. H. Fitzpatrick and A. E. Jones.

AMERICAN TOOL WORKS CO., Cincinnati.—Three radial drills, a shaper, two lathes and a planer will be exhibited. (See Vandyck Churchill Co.); represented by J. C. Hussey, Robert S. Alter, H. W. Schatz, F. L. Stubenroth and C. R. Connors.

AMERICAN WOOD WORKING MACHINERY CO., Rochester, N. Y.—Wood working machines for pattern making will be exhibited; represented by R. T. Martin.

ARCADE MFG. CO., Freeport, Ill.—Various types of the molding machines manufactured by this company, including the hand-operated pattern, the air-operated and the jolt machines will be exhibited. The company will also exhibit one type of air squeezer, a combined jolt and squeezer and four different sizes of core jolters, a jarring machine and a pouring device; represented by E. H. Morgan, Charles Morgan, L. L. Munn, Henry Tscherning, R. E. Turnbull, August Christen, G. D. Wolfley and Mentor Wheat.

ARMSTRONG CORK & INSULATION CO., Pittsburgh.—Insulating materials, including insulating brick for furnaces, core ovens, boiler settings and other high temperature equipment; covering for steam lines, feed water heaters, tank, etc.; cork covering for refrigerated drinking water systems in mills, factories and industrial establishments; corkboard insulation for cold storage and constant temperature rooms, and tile for floors in offices, residences, etc., will be exhibited.

ARROW FORGING & TOOL WORKS, Chicago.—Chisels particularly designed for cleaning castings and various tools used in shipyards and machine shops will be displayed; represented by L. G. Groessl, Benedict, and H. E. Pollard.

ASBURY GRAPHITE WORKS, Asbury, N. J.—The booth occupied by this company will be fitted up as a rest room. Samples of refined graphites and crude graphite from various localities and countries, will be shown; represented by H. M. Riddle Sr., H. M. Riddle Jr. and E. H. Thompson.

ATKINS, E. C., & CO., Indianapolis.—Metal cutting band saw machines, hack saw blades, hack saw frames, metal cutting circular saws and pattern plates will be exhibited; represented by T. H. Endicott, C. F. Neth, Edward Norvel and T. A. Carroll.

AUDUBON WIRE CLOTH CO., Audubon, N. J.—This company proposes to illustrate in detail the construction of foundry riddles, various grades of wire cloth for foundry use, screening and other wire products; represented by Robert T. Korb, William H. Egee and John D. Heins.

AUSTIN CO., Cleveland.—This company will exhibit models, drawings, photographs and literature on standard buildings. Information regarding foundry and steel plant service afforded by this company will be available. The models of buildings will be large enough to show the method of construction, relative sizes and arrangement of foundry equipment; represented by Benton Hopkins, G. A. Dodge, L. D. Stauffer, J. C. Childs, W. L. Bailey and O. D. Conover.

BARRETT CO., Chicago.—Core compounds and facings will be exhibited. The booth will be fitted up as a rest room; represented by W. M. Wilson.

BARTLEY, JONATHAN, CRUCIBLE CO., Trenton, N. J.—The booth occupied by this company will be fitted up as a rest room to which foundrymen are invited; represented by S. H. Dougherty, James W. Tighe, F. P. Welton, Lee T. Ward, M. H. Fike and Lewis H. Lawton Jr.

BERKSHIRE MFG. CO., Cleveland.—Squeezer molding machines of the air and hand operated types, vibrators, snap flasks and pattern equipment will be exhibited by this company; represented by W. D. Fraser and G. L. Cannon.

BESLY, CHAS. H., & CO., Chicago.—Disc and ring wheel, single and double spindle grinders will be demonstrated. A vertical spindle grinder, particularly adapted for foundry work for grinding flasks, will be shown. A patternmaker's disc grinder also will be exhibited under power; represented by E. P. Welles and C. A. Knill.

BIRKENSTEIN, S., & SONS, Chicago.—This company will exhibit nonferrous metals including ingot brass, ingot bronze, ingot copper, pig tin, pig lead, aluminum, manganese bronze, solder, babbitt, phosphor copper and phosphor tin. Castings made from these products also will be shown; represented by H. Birkenstein, C. Raphael, M. Isaacson, B. Schwab, M. Strauss, N. A. Goldman, N. W. Siohm, H. Gildstine, C. Shamroth, J. W. Long, M. Schero and L. Kahan.

BLACK DIAMOND SAW & MACHINE CO., Natick, Mass.—A combined band saw filing and setting machine for setting and filing both wood and metal cutting band saws; a circular saw filing machine; a beveled tooth circular filing machine for wood-cutting circular saws; a brazing outfit for brazing narrow band saws, both wood and metals, and a special metal cutting band saw for sawing brass, bronze and aluminum, will be shown; represented by Walter B. Ambler, Edward Gordon and Strand and Anderson.

BLYSTONE MFG. CO., Cambridge Springs, Pa.—A 7-cubic foot motor driven core sand mixer equipped with a revolving screen will be shown in operation; represented by Luther G. Conroe.

BOOTH-HALL CO., Chicago.—Electric furnace

BORGNER, CYRUS, CO., Philadelphia.—Samples of refractories for use in foundries will be exhibited; represented by George H. Dickel Jr.

BRASS WORLD PUBLISHING CO., New York.—The booth occupied by this company will be fitted out as a rest room; represented by G. A. Tanner, C. N. Manfred, William F. Carns, George A. Jones, C. H. E. Redding.

BROWN INSTRUMENT CO., Philadelphia.—This company will exhibit a complete line of pyrometers, recording thermometers, recording pressure gages, recording tachometers, draft gages, etc. An attempt will be made in this exhibit to show by demonstration the necessity of giving considerable study to the question of core drying; represented by J. P. Geheen, C. C. McDermott, L. M. Morley, J. L. Hacker and A. H. Edwards.

BROWNING, VICTOR R., & CO., Cleveland.—Two half-ton electric hoists of the type developed by this

Convention City

members will register and where the exhibition will be held is on South Thirty-fourth street below Spruce, as shown by the black square within a circle. To reach the exhibition from Broad street, take a westbound Walnut street car, get off at Thirty-fourth street and walk south to the museum. The following is a key to other points in the convention city:

Other Hotels

1. Adelphia
2. Vendig
3. Aldine
4. New Bingham
5. Colonnade
6. Green's
7. Walton
8. Rittenhouse
10. St. James

Railroad Stations

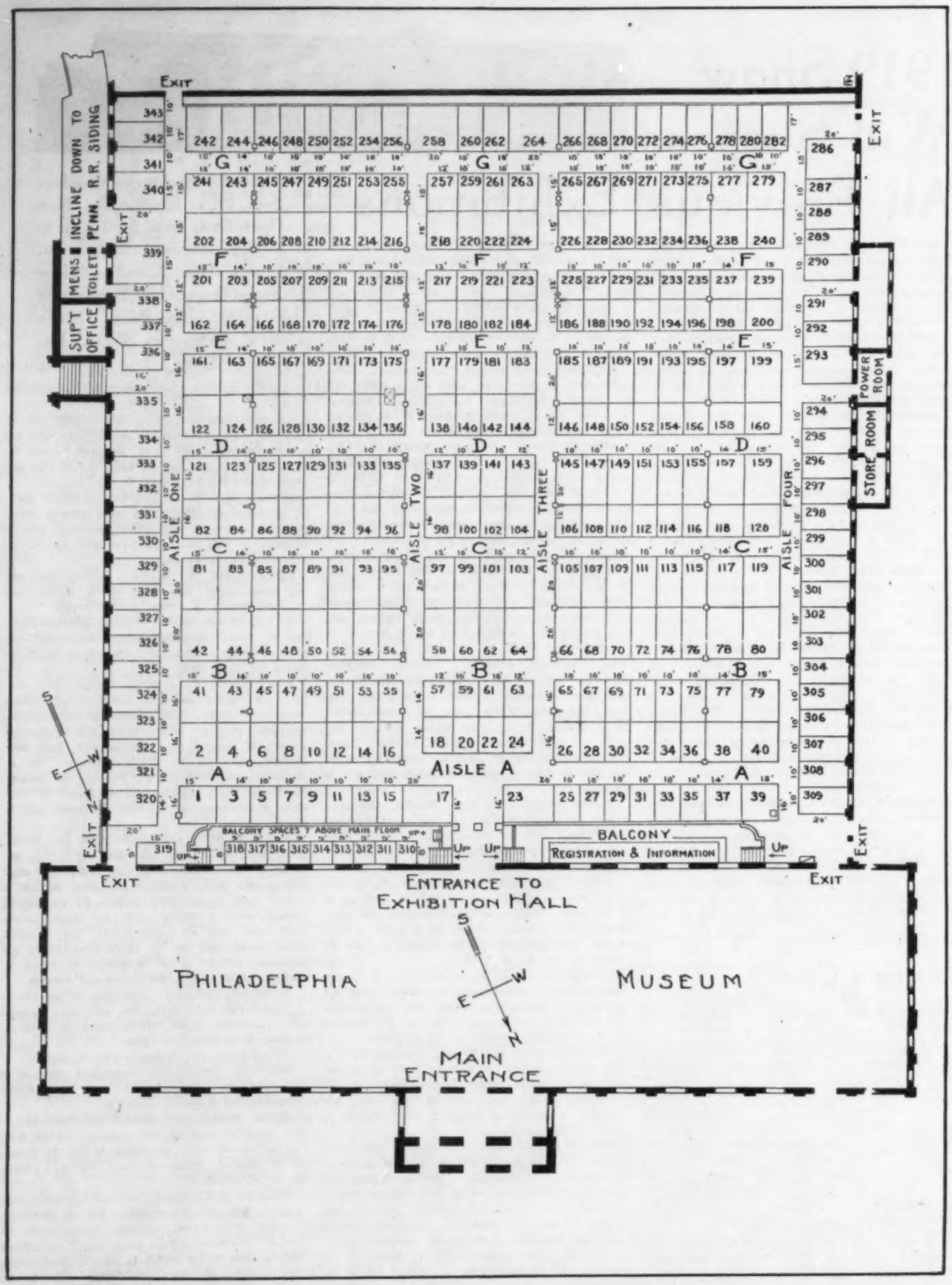
19. Philadelphia & Reading
20. Pennsylvania
21. Baltimore & Ohio

Theaters

11. Academy of Music
12. Walnut
13. Adelphia and Lyric
14. Keith's
15. Garrick
48. Shubert's

Points of Interest

22. Historical society
24. Academy of Natural Sciences
26. United States mint
27. Baldwin Locomotive works
28. Academy of Fine Arts
29. Central post office
33. Franklin institute
34. Betsy Ross house
35. Christ church
36. Independence hall
37. The Bourse
38. Custom House
39. Carpenter's hall
43. Drexel institute
52. Chestnut street wharf
X. Subway—elevated stations



EXHIBITION HALL, PHILADELPHIA COMMERCIAL MUSEUM, WITH EXHIBITORS' BOOTHS NUMERICALLY INDICATED

The Philadelphia Commercial Museum is on South Thirty-fourth street below Spruce street. For directions for reaching the museum from Broad street see pages 824 and 825

List of Exhibitors at Philadelphia Show

No. of Booth	Exhibitor
8	Abrasive Co.
75	Acheson Graphite Co.
320, 321	Air Reduction Sales Co.
96, 98, 100, 102, 104	Ajax Metal Co.
65	American Gum Products Co.
10	American Kron Scale Co.
38	American Manganese Bronze Co.
178	American Oil & Supply Co.
289, 290	American Wood Working Mchy. Co.
185, 187, 189, 191	Arcade Mfg. Co.
88	Armstrong Cork & Insulation Co.
130	Arrow Forging & Tool Works.
71	Asbury Graphite Mills.
2, 4	Atkins, E. C., & Co., Inc.
315	Audubon Wire Cloth Co.
3	Austin Co., The
	American Tool Works.
311	Barrett Co.
29, 31	Bartley, Jonathan, Crucible Co.
160	Berkshire Mfg. Co.
81, 83	Besly, Chas. H., & Co.
34	Birkenstein, S., & Sons, Inc.
45	Black Diamond Saw & Machine Co.
	Blystone Mfg. Co.
168	Booth-Hall Co.
312	Borgner, Cyrus, Co.
30	Brass World Publishing Co.
36	Brown Instrument Co.
193	Browning, Victor R., & Co.
230, 232	Buch Foundry Equipment Co.
322, 323	Bullard Machine Tool Co.
216	Carborundum Co.
269, 271	Champion Foundry & Machine Co.
91	Chase, Frank D., Inc.
341, 342, 343	Chesapeake Iron Works.
101	Chicago Crucible Co.
333, 334, 335	Chicago Pneumatic Tool Co.
329, 330	Cincinnati Pulley Machinery Co.
110	Clark, Chas. J.
301, 302, 303, 304	Cleveland Osborn Mfg. Co.
96	Cleveland Pneumatic Tool Co.
51	Clipper Belt Lacer Co.
260, 262	Coale, Thomas E., Lumber Co.
221	Combined Supply & Equipment Co.
151	Combustion Economy Corp.
318	Collieries Supply & Equipment Co.
132	Corn Products Refining Co.
198, 200	Curtis Pneumatic Machinery Co.
23, 25	*Daily Iron Trade and Metal Market Report.*
277, 279	Davenport Machine & Foundry Co.
287, 288	Davis-Bournonville Co.
141, 143	Debevoise-Anderson Co.
127, 129	Dings Magnetic Separator Co.
89, 91	Disston, Henry, & Sons.
18	Dixon, Joseph, Crucible Co.
263	Electric Furnace Co.
140	Electric Furnace Construction Co.
43	Emmert Mfg. Co.
234, 236, 273, 275	Federal Foundry Supply Co.
223	Foreign Crucibles Corp.
23, 25	*Foundry, The*
238	Foundry Appliance Co.
237, 239	Foundry Equipment Co.
316	Foundry Manganese Co.
122, 124, 126, 128	Gardner Machine Co.
324, 325, 326	General Electric Co.
	Geometric Tool Co.
245	Gordon, Robert, Inc.
137, 139	Graceton Coke Co.
206, 208	Grand Rapids Grinding Machine Co.
114, 116	Great Western Mfg. Co.
106	Grimes Molding Machine Co.
57	Hardy, Clement A., Co.
12	Hardy, F. A., & Co.
5	Harris, Benjamin, & Co.
136	Hauck Mfg. Co.
194, 196	Hausfeld Co.
166	Haynes Stellite Co.
202, 204	Hayward Company.
254, 256	Heald Machine Co.
241, 243	Herbert, Alfred, Ltd.
258	Herman Pneumatic Machine Co.
	Higley Machine Co.
242, 244	Hoevel Mfg. Co.
310	Holcroft & Co.
97, 99	Hyatt Roller Bearing Co.
337	Industrial Electric Furnace Co.
175	Ingersoll-Rand Co.
	International Machine Tool Co.
39	International Molding Machine Co.
32	Interstate Sand Co.
15, 17	*Iron Age.*
23, 25	*Iron Trade Review, The*
20	Jennison-Wright Co.
215	Keller Pneumatic Tool Co.
144	Kellogg, Spencer, & Sons, Inc.
259	Kelly, T. P., Co.
61	King, Julius, Optical Co.
181	Klaxson Co.
27	Knoeppel, C. E., & Co.
	Kempsmith Mfg. Co.
172	Lane, H. M., Co.
170	Leeds & Northrup Co.
251	Liberty Supply Co.
255	Liberty Steel Products Co., Inc.
338	Lincoln Electric Co.
211	Lindsay Chaplet & Mfg. Co.
90, 92	Link Belt Co.
78, 80	Louden Machinery Co.
95	Lupton's, David, Sons Co.
113, 115	McCormick, J. S., Co.
41	McCrosky Tool Corp.
103	McLain's System, Inc.
22	Maclean Publishing Co.
278, 280	Macleod Company, The
201	Magnetic Mfg. Co.
203	Mahr Mfg. Co.
240	Malleable Iron Fittings Co.
77	Marden, Orth & Hastings Co.
205	Mason, Arthur C., Inc.
6	Maxon Premix Burner Co.
112	Menefee Foundry Co.
177	Mercury Mfg. Co.
59	*Metal Industry.*
16	Metal & Thermit Corp.
138	Michigan Smelting & Refining Co.
7	Mifflin Chemical Co.
282	Milburn, Alexander, Co.
339	Mine & Smelter Supply Co.
72, 74, 76	Monarch Engineering & Mfg. Co.
161, 163, 165, 167	Monarch Machinery Co.
286	Mott Sand Blast Co.
158	Mumford Molding Machine Co.
162	Napier Saw Works, Inc.
117, 119	National Engineering Co.
153, 155	Nicholls, William H., Co.
49	Norma Co. of America.
131, 133, 135	Norton Co.
	Oakley Machine Tool Co.
66, 68, 70	Obermayer, S., Co.
180	Ohio Blower Co.
169	Oldham, George, & Son Co.
157, 159, 118, 120	Oliver Machinery Co.
331, 332	Oxweld Acetylene Co.
264, 266, 268, 270, 272, 274,	
276	Pangborn Corp.
305, 306, 307, 308, 309	Paxson, J. W., Co.
23, 25	Penton Publishing Co.
222	Pettinos, Charles E.
13	Pettinos, George F.
207	Philadelphia Grease Co.
9, 11	Pickands, Brown & Co.
224	Pittsburgh Crushed Steel Co.
195	Pittsburgh Furnace Co.
145, 147, 149	Pridmore, Henry E., Inc.
182	Portage Silica Co.
250	Providence Gas Co.
40	Quigley Furnace Specialties Co.
210, 212	Racine Tool & Machine Co.
53, 55	Railway Mechanical Engineer.
24	Rainey, W. J.
179	Republic Creosoting Co.
225, 227, 229	Rich Foundry Equipment Co.
33, 35	Richards Wilcox Mfg. Co.
37	Robeson Process Co.
62, 64	Rogers, Brown & Co.
73	Roots, P. H. & F. M., Co.
231, 233, 235, 186, 188, 190, 192	Sand Mixing Machine Co.
121, 123	Sellers, William, & Co., Inc.
82, 84, 86	Shepard Electric Crane & Hoist Co.
47	Simonds Mfg. Co.
252	Skinner Bros. Mfg. Co.
226, 265	Sly, W. W., Mfg. Co.
63	Smith, R. P., & Sons Co.
58, 60	Smith, Werner G., Co.
291	Spencer Turbine Co.
111	Standard Sand & Machine Co.
171	Standard Shop Equipment Co., Inc.
257, 218, 220	Sterling Wheelbarrow Co.
249	Straub & Buegeleisen.
292, 293	Sullivan Machinery Co.
184	Swan & Finch Co.
85	Swind Machinery Co.
294, 295, 296, 297, 298, 299, 300	Tabor Mfg. Co.
164	Thomas Elevator Co.
183	Thomas Iron Co.
313	Thompson, Lewis, & Co., Inc.
1	Truscon Steel Co.
219	United Compound Co.
142	United States Graphite Co.
197, 199	U. S. Molding Machine Co.
217	United States Silica Co.
42, 44, 46, 48, 50, 52	Van Dyck-Churchill Co.
336	Vibrating Machinery Co.
209	Willson, T. A., & Co.
340	Wadsforth, H. L.
176	Wadsworth Core Machine & Equipment Co.
110	Wangelin, Walter H., & Co.
56	Wallace, J. D., & Co.
327, 328	Warner & Swasey Co.
246, 248	Westinghouse Electric & Mfg. Co.
26	White & Bro., Inc.
261	Whitehead Bros. Co.
105, 107, 109	Whiting Foundry Equipment Co.
69	Wood's, T. B., Sons Co.
146, 148, 150, 152, 154, 156	Woodison, T. J., Co.
125	Whitman & Barnes Mfg. Co.
79	Young Bros. Co.

company will be exhibited; represented by Sheldon M. Hird, C. R. Rudinger and Harry H. Green.

BUCH FOUNDRY EQUIPMENT CO., York, Pa.—This company will exhibit corrugated steel molding flasks, aluminum flasks, pattern frames, adjustable jackets, adjustable steel bars and electrically and air operated jar, squeeze, rollover and pattern draw molding machines; represented by R. S. Buch and D. C. Coble.

BULLARD MACHINE TOOL CO., Bridgeport, Conn.—This company will exhibit an 8-inch automatic multiple vertical boring mill in operation; represented by S. H. Bullard, F. B. Smith, J. W. Bray, John Beirne, Frank E. Hatch Jr. and J. H. Van Yorx.

CARBORUNDUM CO., Niagara Falls, N. Y.—Departing somewhat from its usual exhibit, the company this year will feature refractories. A Gilbert & Parker furnace equipped with an entire lining of carborundum refractory material will be operated during the convention. Seven different refractory cements and other forms of refractories, including brick will be exhibited and demonstrated. As usual, abrasive materials for use in foundries will be shown; represented by C. E. Hawke, H. E. Kerwin, O. C. Dobson, W. L. Meck, H. G. Kretchmar and G. T. Estabrook.

CHAMPION FOUNDRY & MACHINE CO., Chicago.—A 16-inch jolt rollover molding machine fitted with a pattern and operated as a molding machine, and a similar machine fitted with a core box and operated as a core machine will be exhibited. An electrically operated sand riddle will also be shown in operation; represented by T. J. Magnuson, H. O. Magnuson and A. Magnuson.

CHASE, FRANK, D., Inc., Chicago.—This exhibit will consist of photographs and descriptions of foundries designed and built by this company; represented by Frank D. Chase, Morris W. Lee, W. H. Lenish, A. A. Wickland, C. B. Teter.

CHESAPEAKE IRON WORKS, Baltimore, Md.—The exhibit will show the features of the electric traveling crane manufactured by this company and illustrate the character of the great variety of steel structures and bridges that it has built and erected in the United States.

CHICAGO PNEUMATIC TOOL CO., Chicago.—A 14 x 9 x 14-inch air compressor will be operated by this company. It also will exhibit chipping and riveting hammers of all sizes, air and electric drills, pneumatic and electric grinders, sand rammers for bench and floor work, pneumatic geared and cylinder hoists, air hose, hose couplings, and miscellaneous accessories; represented by W. P. Pressinger, A. C. Andresen, A. M. Brown, Nelson B. Gatch, B. F. Eissler, T. G. Smallwood, Ross Watson and T. G. Slingman.

CINCINNATI PULLEY MACHINERY CO., Cincinnati.—Representative sizes and styles of drilling machines manufactured by this company, including machines particularly designed for speeds as high as 12,000 revolutions per minute will be exhibited. Three sizes of sensitive machines, an automatic drilling machine, and machines equipped with built-in tapping attachments will also be shown; represented by J. G. Hey, J. F. Mirrielees and D. A. Patterson.

CLARK, CHARLES J., Chicago.—Blast volume meters and other instruments will be exhibited; represented by Charles J. Clark.

CLEVELAND OSBORN MFG. CO., Cleveland.—Molding machines will be exhibited, including direct draw roll over jolt machines, combination jolt stripper squeezer machines, plain air squeezers, combination jolt squeezers, hand roll over machines and core jolt machines; represented by J. C. Alberts, H. R. Atwater, E. J. Byerlein, E. T. Doddridge, H. E. Deakins, R. E. Kiefer, E. W. Jacobi and F. T. Spikerman.

CLEVELAND PNEUMATIC TOOL CO., Cleveland.—Pneumatic tools and accessories including riveting and chipping hammers; air drills; foundry rammers in two sizes, for floor bench and core work; portable emery grinders in two sizes for use in steel, gray iron and aluminum work; air hose couplings in sizes from ¼ to 1¼-inch; pressure seated air valves, and air hose fittings will be exhibited. The foundry tools will be in operation during the convention; represented by H. E. Covey, Arthur Scott, H. C. Newton, Charles Garner, G. Gregory, F. E. Schwarze and Capt. Frank H. Burr.

CLIPPER BELT LACER CO., Grand Rapids, Mich.—Belt lacers, belt hooks, and twisted rawhide and composition pins used with them will be exhibited. The belt lacer which is operated by hand, will be demonstrated; represented by William F. Kall.

COALE, THOS. E., LUMBER CO., Philadelphia.—Pattern lumber including Michigan soft cork white pine and California sugar pine will be exhibited; represented by Thomas E. Coale and A. Warren Anderson.

COLLIERIES SUPPLY & EQUIPMENT CO., Buffalo.
COMBINED SUPPLY & EQUIPMENT CO., Buffalo.—The chaplets and skim gates manufactured by this company will be exhibited; represented by Stephen LeViness Jr. and C. L. Jackson.

COMBUSTION ECONOMY CORP., Chicago.—A new design of powdered coal feeding and burning equipment equipped with an air-tight rotary air gate, a variable speed direct connected gear case with speeds marked to conform with the operation of the air gate, and a powdered coal carburetor will be displayed. This equipment has a maximum capacity of 75 pounds of coal per minute; represented by George Furman and A. J. Grindle.

CORN PRODUCTS REFINING CO., New York.—The making of cores with the core binder manufactured by this company will be demonstrated. A collection of cores made in this manner will be exhibited; represented by S. B. Krantz, J. A. Oates, F. G. Faller Jr., A. H. Kreischer, D. T. McGrory and J. M. Remmes.

A CORNER IN SHOW TWO YEARS AGO

CURTIS PNEUMATIC MACHINERY CO., St. Louis.—This company will have an operating exhibit consisting of an overhead pneumatic crane with air hoist, an electrically driven double cylinder air compressor, a bracketed jib crane, single I-beam trolleys and air hoists. All equipment will be operating under actual foundry and machine shop conditions; represented by Joseph Macksey and C. C. Main.

DAILY IRON TRADE AND METAL MARKET REPORT, Cleveland.—This booth will be fitted up as a rest room for visitors where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, H. Cole Estep, G. O. Hays, E. L. Shaner, H. E. Diller, D. M. Avey, Pat Dwyer, Charles Vickers, J. F. Ahrens, F. V. Cole, H. O. Taylor and Paul R. Fisher.

WANGELIN, WALTER H., & CO., St. Louis.—A calculator by which mixtures of iron may be rapidly figured will be exhibited; represented by Walter H. Wangelin.

DAVENPORT MACHINE & FOUNDRY CO., Davenport, Iowa.—Molding machines, including a combination jolt roll over pattern draw machine; a 30 x 30-inch jolt stripper and a jolt squeezer will be exhibited; represented by J. T. Anderson, A. V. Magnuson, A. Ziebarth, William Hetzel and Carl Falk.

DAVIS-BOURNONVILLE CO., Jersey City, N. J.—Oxyacetylene welding and cutting apparatus, including stationary and portable equipment, acetylene pressure generators, torches, regulators, etc., and recent developments in cutting and welding machines will be exhibited; represented by W. W. Barnes and H. H. Dyar.

DEBEVOISE-ANDERSON CO., New York.—The exhibit will consist of samples of foundry, furnace and crushed coke; coke and charcoal iron; iron ore; iron ore nodules; fluor spar; ganister; limestone, calcite and dolomite; represented by N. Anderson, P. Debevoise, C. K. Sutton, P. Brooks and C. A. Wyatt.

DINGS MAGNETIC SEPARATOR CO., Milwaukee.—Three of the standard foundry type separators made by this company, including a 12 x 18-inch complete pulley separator, and all equipped with motors for self contained drive, will be exhibited; represented by E. S. Hirschberg and R. A. Manegold.

DISSTON, HENRY, & SONS, Philadelphia.—This company will exhibit a large metal cutting machine in operation. Various types of saws for cutting several kinds of metal will be displayed; represented by W. R. Kendall, Joseph Dorrington, R. B. Mackenzie, R. H. Harris and Messrs. Paul, Dorsey and Hean.

DIXON, JOSEPH, CRUCIBLE CO., Jersey City, N. J.—Various sizes of standard crucibles, covers, scorifiers and phosphorizers will be shown; represented by H. C. Sorenson, R. R. Belleville, J. A. Condit, C. A. Shaw, R. H. Brinkerhoff, R. F. Leonard and J. Moses.

ELECTRIC FURNACE CO., Alliance, O.—Castings produced in various foundries by means of the electric furnaces made by this company will be shown. Two moving picture reels of installations, one showing brass melting equipment and another showing heat-treating furnaces, will be displayed in the booth occupied by this company; represented by R. F. Benzinger and D. D. Miller.

ELECTRIC FURNACE CONSTRUCTION CO., Philadelphia.—The booth occupied by this company will be fitted up as a rest room and office, and pamphlets, photographs and possibly samples of steel produced in Greaves-Etchells electric furnaces, may be shown; represented by Frank Hodson, F. W. Brooke, H. H. Twose and Neil Neville.

EMMERT MFG. CO., Waynesboro, Pa.—A drawing instrument, adjustable drawing board equipment and universal bench vises for wood and metal workers will be exhibited. Oscillating and disc sanders, saw filing and setting machine, drill chuck, steel clamps, grinders and bench planer, a band saw, a bench saw and several other wood working tools will be shown; represented by Edward Gordon, H. S. Kuhn, A. G. Blazier, D. C. Kane and J. Lapides.

FEDERAL FOUNDRY SUPPLY CO., Cleveland.—A new molding machine designed by John T. Stoney, superintendent at the Ferro Foundry & Machine Co., Cleveland, will be exhibited. With this machine, it is claimed, that four men can mold at one time. A number of machines, including plain jolts, combination jolt and squeeze and plain squeezer machines and air and electrically operated vibrators and snap flasks will be shown; represented by Ralph Ditty, Ellsworth Kaye, W. J. Smith, John Bayer and H. W. Trevett.

FOREIGN CRUCIBLE CORP., New York.—French graphite crucibles which can be made in any of the standard American sizes for brass and steel melting will be exhibited; represented by R. N. Stevens and L. J. Rebele.

FOUNDRY, THE, Cleveland.—This booth will be fitted up as a rest room for visitors where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, H. Cole Estep, G. O. Hays, E. L. Shaner, H. E. Diller, D. M. Avey, Pat Dwyer, Charles Vickers, J. F. Ahrens, F. V. Cole, H. O. Taylor and Paul R. Fisher.

FOUNDRY APPLIANCE CO., Newark, N. J.—The cope handling device manufactured by this company will be exhibited. This device is an attachment to a squeezer type molding machine which handles the cope and draws the pattern; represented by J. N. Frantz.

FOUNDRY EQUIPMENT CO., Cleveland.—Various types of ovens for cores and molds will be shown; represented by F. A. Coleman and C. A. Barnett.

FOUNDRY MANGANESE CO., Philadelphia.—This exhibit will consist of ground and lump ferromanganese and silicon, and ground chrome ore; represented by Horace Morgan.

GARDNER MACHINE CO., Beloit, Wis.—This company will exhibit new roll grinders, representative

single spindle disc grinders, heavy duty disc grinders and a 53-inch vertical spindle disc grinder; represented by W. B. Leshman, W. L. Townsend, H. C. Steinbuck, A. A. Swinnerton and F. M. Risler.

GENERAL ELECTRIC CO., Schenectady, N. Y.—An arc welding set will be exhibited; also a cupola blower compressor driven by a 30-horsepower motor. The compressor has a capacity of 4500 cubic feet per minute with one pound pressure when operating at 3450 revolutions per minute; represented by J. M. Hollister, B. L. Spain, B. C. Tracy, L. W. Shugg, Edmond Vonseteeg and C. K. West.

GEOMETRIC TOOL CO., New Haven, Conn.—Threading tools with examples of work performed by them will be exhibited at booth of Vandyck-Churchill Co.; represented by C. F. White.

GORDON, ROBERT, INC., Chicago.—A mechanical hot blast heater will be exhibited. This heater has a capacity to circulate 10,000 cubic feet of air per minute at approximately 200 degrees Fahr. The heater will be in operation and a special casing will be designed for this exhibition so that the heater may be opened to show internal construction; represented by T. H. Monaghan, H. H. Engle and R. M. Zimmerman.

GRACETON COKE CO., Graceton, Indiana Co., Pa.—Foundry coke and castings and photographs of castings manufactured by users of the coke made by this company will be exhibited. Views of the plant will be displayed; represented by C. M. Lyngle.

GRAND RAPIDS GRINDING MACHINE CO., Grand Rapids, Mich.—The exhibit will consist of grinding machinery, including two types of universal cutter, reamer and tool grinders; five types of drill grinders, two of which will be operated, and new grinders for castings; represented by Owen Livingston and J. Cekoning.

GREAT WESTERN MFG. CO., Leavenworth, Kans.—Three types of gyratory foundry riddles, and renewable bottom sieves will be shown by this company; represented by F. A. Pickett and George W. Combs.

GRIMES MOLDING MACHINE CO., Detroit.—A new model jolt rollover molding machine and a small hand rollover molding machine will be exhibited; represented by George L. Grimes, L. V. Grimes, Charles Skeffington and Oswald Corliss.

HARDY, CLEMENT A., CO., Chicago.—Photographs of plants under construction by this company, including foundries for the Defiance Machine Works and the Hercules Gas Engine Co., will be shown; represented by C. A. Hardy.

HARDY, F. A., & CO., Chicago.—Safety goggles, eye protectors, masks, helmets, etc., will be displayed. The company also will exhibit safety signs, leggings, gloves and hospital apparatus; represented by A. U. Barnes.

HARRIS, BENJAMIN, & CO., Chicago.—Yellow brass and composition ingots and copper bearing materials will be exhibited in the booth occupied by this company; represented by Louis Goldman, Nathan Harris, Oscar Harris, Max Goldman and Dean F. Carcaddden.

HAUCK MFG. CO., Brooklyn, N. Y.—This company will exhibit oil burning apparatus for lighting cupolas, heating ladles, drying molds and patching cores; furnaces for melting metals; sand dryers; hand kerosene torches; rivet forges; brazing and blacksmith forges; furnace burners of the low and also high pressure types; preheaters for welding; soldering iron heating furnaces, and salamanders; represented by Arthur E. Hauck, H. H. Kress, A. H. Stein, G. N. Broadhurst, G. T. Shanley, F. E. Giersch and A. M. Thomson.

HAUSFELD CO., Harrison, O.—A noncrucible furnace of the tilting type, a tilting crucible furnace, a stationary crucible furnace, an aluminum melting furnace using a cast iron melting pot, a ladle heater and other foundry equipment for nonferrous metal will be exhibited; represented by E. B. Hausfeld, Joseph Hausfeld and J. S. Armour.

HAYNES STELLITE CO., Kokomo, Ind.—

HAYWARD CO., New York.—An exhibit will be made of working models of clamshell and orangepeel buckets and an electric motor bucket of this type also will be shown in operation. In addition to the foregoing equipment, a collection of photographs illustrating this company's machines in operation in foundries and other industries will be displayed; represented by C. F. Hutchings.

HEALD MACHINE CO., Worcester, Mass.—The types of internal grinders, a 12-inch rotary surface grinder and a cylinder grinder will be exhibited by this company. One of the internal grinders is a new machine which never has been exhibited and which has not been sold. The rotary surface grinder also is new. The cylinder grinder is designed for work which cannot be revolved; represented by S. M. Hershey.

HERBERT, ALFRED, LTD., New York.—British-made machine tools bearing the name of this company will be exhibited for the first time in the United States. All of the machines will be shown in operation. An oscillating tool grinder which produces cutting tools from bar stock by grinding and which, except for special shapes, eliminates the necessity of tool forging, will be shown. A hexagon turret lathe with a capacity of 1⅛ x 27 inches for rapid production of bar work and a combination turret lathe especially adapted for chucking work will be exhibited. Both machines are of the single pulley geared head type. The hexagon turret lathe is equipped with quick power traverse and the turret is rotated by power. A concentric chuck which is adapted for eccentric and irregular work will also be

GLIMPSE OF BOSTON SHOW

shown; represented by Messrs. Blake, Blair, A. Thornton and Albin.

HERMAN PNEUMATIC MACHINE CO., Pittsburgh.—A plain jarring machine, with the table plate off of the base to show the mechanical construction of the machine will be exhibited; represented by Thomas Kaveny, H. T. Frauenheim, Robert F. Ringle, I. J. Oestering, R. P. Morgan, Robert Porteous, Walter Hughes, C. S. McMath and C. W. Miller.

HIGLEY MACHINE CO., So. Norwalk, Conn.—A motor-driven cold saw will be exhibited in the booth of the Vandyck-Churchill Co.; represented by C. Granger.

HOEVEL MFG. CORP., Jersey City, N. J.—This company will have a working exhibit consisting of a revolving barrel and rotary table sandblast machine; represented by H. F. Hoevel and L. B. Passmore.

HOLCROFT & CO., Detroit.—Photographs, drawings and data on various types of metallurgical furnaces and foundry ovens and also data on special electric furnaces, will be exhibited by this company; represented by Charles T. Holcroft, E. V. Holcroft, W. H. Holcroft, Harry Holcroft and H. L. Ritts.

HYATT ROLLER BEARING CO., New York.—This company will exhibit a large revolving model of roller bearing showing the principles of design and construction; a roller bearing mounted in glass showing the lubrication principles of the bearing; an automatic lantern slide machine showing pictures of roller bearing equipped machinery; and a truck test stand having roller bearing-equipped trucks and plain bearing trucks, demonstrating easy running qualities of the roller bearing equipped trucks; represented by D. Gleisen, P. C. Gunion, M. F. Lawrence, G. O. Helmstaedter, W. L. Iliff, J. M. Hancock and H. L. Littell.

INDUSTRIAL ELECTRIC FURNACE CO., Chicago.—Illustrations of the furnaces made by this company and their applications to various branches of the foundry industry will be shown. A recently developed process of preheating the charge before placing it in the electric furnace, will be described; a new jolt shakeout machine for separating sand from castings and flasks will be illustrated; represented by F. von Schlegell, W. B. Lewis and W. B. Cooley.

INGERSOLL-RAND CO., New York.—Portable pneumatic tools including sand rammers, motor hoists, chipping hammers, riveting hammers, grinders and drills will be exhibited. The sand rammers, motor hoists, grinders and chippers will be in operation; represented by W. A. Johnson, W. B. Brendlinger, P. T. Christy, N. A. Pelham and G. C. Williams.

INTERNATIONAL MACHINE TOOL CO., Indianapolis.—An 18-inch Libby turret lathe working on cast iron gears will be exhibited by this company through its Philadelphia representative, Vandyck-Churchill Co.; the International Machine Tool Co. will be represented by J. A. Villard.

INTERNATIONAL MOLDING MACHINE CO., Chicago.—Molding machines including hand and power turnover machines, jarring machines, squeezers, stripping plate machines and various types of combination machines will be exhibited; represented by Edward A. Pridmore, W. W. Miller, F. W. Hamel and E. G. Borgnis.

INTERSTATE SAND CO., Zanesville, O.—This exhibit will consist of molding sands for iron and steel castings; fire clay; silica washes and ganister; represented by L. K. Brown, E. M. Ayers and O. Tague.

IRON AGE, New York.

IRON TRADE REVIEW, THE, Cleveland.—This booth will be fitted up as a rest room for visitors where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, H. Cole Estep, G. O. Hays, E. L. Shaner, H. E. Diller, D. M. Avey, Pat Duyer, Charles Vickers, J. F. Ahrens, F. V. Cole, H. O. Taylor and Paul R. Fisher.

JENNISON-WRIGHT CO., Toledo, O.—Samples of the wood blocks manufactured by this company for factory floors will be exhibited and a made-up section of wood block flooring will be displayed. Large photographic reproductions of wood block floors now in service in many well known foundries and machine shops in the United States will be shown; represented by F. E. Jennison and L. P. Drinker.

KELLER PNEUMATIC TOOL CO., Chicago.—A large riveting hammer mounted in a heavy gilt frame and with sections cut out to show all parts moving in the same manner as those in a standard hammer operated by air will be shown. Drills and other tools in operation with portions of the wall removed to show the movement of the parts will be displayed, together with complete models of riveting and chipping hammers, valve and valveless rotary and piston drills, jam riveters, holders-on and sand rammers; represented by W. H. Keller, J. G. Osgood, G. E. McCabe, F. S. Eggleston Jr., W. J. Devlin, C. A. Bremmer, L. B. Smyser, Edward L. Lycett and A. G. Swope.

KELLOGG, SPENCER, & SONS, INC., Buffalo.—Various grades of core oils made by this company and a number of interesting cores produced with these oils and also castings and photographs of large castings produced by the use of cores made with these oils will be on exhibition; represented by V. H. Hunter, U. L. Throm, A. P. Mason, J. N. Yaeger, W. L. Goetz, E. G. Allen and Burt Cox.

KELLY, T. P., & CO., New York.—The booth occupied by this company will be fitted up as a rest room; represented by V. J. Rohe, H. J. Winters, B. H. Forman, H. F. Maurel and W. F. Kaine.

KING, JULIUS, OPTICAL CO., Chicago.—Safety goggles, glass for goggles, and protective helmets, masks, etc., will be exhibited; represented by W. G. King.

KLAXON CO., New York.—This company will demonstrate a code calling device for locating men at any point in a manufacturing plant or foundry. The company also will exhibit industrial horns for signalling purposes and a specially designed telephone which is a loud speaking phone for quick, convenient intercommunication; represented by E. Berg, P. C. Gunion, R. L. Wilkinson and A. W. Hall.

KNOEPPEL & CO., C. E., New York.—Graphic

production control boards designed for controlling the factors effecting foundry operation and production will be exhibited. This system of visualized control is designed to definitely govern the movement of material, application of labor, the use of equipment and machines, and furnishes records of plant conditions and performances for cost analysis; represented by J. P. Jordan and Irving A. Berndt.

KEMPSMITH MFG. CO., Milwaukee.—A horizontal plain milling machine equipped with single pulley drive, 1¾-inch arbor, two arbor supports, plain vise and necessary accessories will be shown. This machine has 18 feeds and speed changes, the feeds varying from ¾ to 25 inches per minute. This machine will be exhibited through the Vandyck Churchill Co., Philadelphia. The Kempsmith Mfg. Co. will be represented by Peter Lowe and Mr. Drewes.

LANE, H. M., CO., Detroit.—Photographs and drawings of the engineering work of this company will be shown; represented by H. M. Lane, A. O. Thomas, Benjamin Towlen, Charles R. Seabrook, D. W. F. Nichols, A. O. Thomas, Charles Rochefort.

LEEDS & NORTHRUP CO., The, Philadelphia.—Pyrometer equipment consisting of indicating and recording instruments used in controlling temperatures in the foundry such as core ovens, etc., will be exhibited. An optical pyrometer for reading temperatures of molten metals also will be shown; represented by G. W. Tall Jr., E. B. Estabrook, Oscar Brewer and A. M. Redding.

LIBERTY STEEL PRODUCTS CO., INC., New York.—Two types of a gasoline motor driven industrial tractor and two lift trucks will be exhibited. A model of the type of sectional steel building manufactured by this company will be shown; represented by Charles K. Drury, W. Robbins, T. L. Lawry, S. W. Midgley, W. S. Ottinger Jr. and A. H. Dillon Jr.

LIBERTY SUPPLY CO., Pittsburgh.—

LINCOLN ELECTRIC CO., Cleveland.—This company will exhibit arc-welding apparatus used in foundries. A motor operating under water and several sizes and types of foundry motors will be shown; represented by Robert E. Kinkead, Dorsey C. Anderson, O. P. Lang and P. C. Pipes.

LINDSAY CHAPLET & MFG. CO., Philadelphia.—This exhibit will consist of chaplets ranging in size from those ¼-inch in length used for motor castings to large double head chaplets having ¾ and 1-inch stems and being as long as 6 inches with plates 4 x 4 inches square and ½-inch thick used in connection with making castings for bed plate castings for gun presses; represented by Stanley B. Wentz, James C. Newlin Jr. and Herman E. Mandel.

LINK BELT CO., Philadelphia.—This company will exhibit a machine which reclaims used molding sand. This machine tempers and mixes the sand and prepares it for further use. An overhead monorail electric hoist equipped with cord operated control designed for handling molds and cores without jarring will be exhibited. A silent chain drive will be in operation; represented by A. G. J. Rapp, F. F. Waechter, James Monroe and L. Spillan.

LOUDEN MACHINERY CO., Fairfield, Iowa.—Overhead tracks and trolleys for use in foundries will be exhibited. Special carriers and containers for metal and various foundry materials will be shown; represented by H. M. Miller, L. E. Gaston, C. S. Doran, H. W. Cuddy and L. E. Berthold.

LUPTON'S, DAVID, SONS' CO., Philadelphia.—Samples of pivoted steel sash, counterbalanced steel sash, power house steel sash, and continuous sash designed for moniter, sawtooth and sidewall construction will be shown. About 10 typical cross-sections of foundries and buildings of similar nature will be shown on a mechanically operated device especially built for this exhibit; represented by Clarke P. Pond, C. P. P. Buckwalter, R. A. Sanborn and H. R. Wilkinson.

McCORMICK, J. S., CO., Pittsburgh.—Included in the foundry equipment exhibited by this company will be a pneumatic blacking mixer operated with outlets for spraying purposes; an electric magnetic separator which will be shown in operation; an embossing machine for use in the pattern shop, and samples of blacking made by this company; represented by J. S. McCormick, T. E. Malone and S. R. Costley.

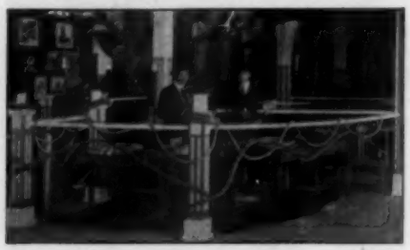
McCROSKY TOOL CORP., Meadville, Pa.—This exhibit will consist of a complete line of adjustable reamers, quick change chucks and collets for drill press work, turret tool posts for lathes, and universal lamp brackets; represented by C. M. Sutton, C. Harper Halfmann and M. J. Frank.

MACLEAN PUBLISHING CO., LTD., Toronto, Ont.—The booth occupied by this company will be fitted out as a rest room; represented by A. R. Lowe, A. H. Byrne, B. G. Newton and F. H. Bell.

McLAIN'S SYSTEM, INC., Milwaukee.—Samples of semisteel castings of light sections including automobile cylinders containing from 20 to 30 per cent steel; and gears, pistons, projectiles and other samples of semisteel castings containing from 20 to 50 per cent steel will be shown. Open-hearth steel castings poured from metal made in a McLain-Carter oil-fired, open-hearth furnace will be displayed; represented by David McLain, Harry McLain and I. V. Scanlan.

MACLEOD CO., THE, Cincinnati, O.—Two sand blast barrels, a sand blast hose machine and portable oil burners will be exhibited by this company; represented by Harry Rittmeyer.

MAGNETIC MFG. CO., Milwaukee.—Various types of magnetic separators built by this company will be shown in operation. These will include a machine of all-steel construction for reclaiming metal from



A FEW BOOTHS IN 1917

foundry refuse and cupola drop. A magnetic pulley provided with ventilating device will be shown; represented by R. H. Stearns, J. P. Bethke and R. N. Stearns.

MAHR MFG. CO., Minneapolis.—This company will exhibit foundry torches, oil and gas fired rivet forges, ladle driers and ladle heaters; represented by H. H. Warner, W. G. Barstow and R. B. Ecker.

MALLEABLE IRON FITTINGS CO., Branford, Conn.—A number of vibrators manufactured by this company will be operated by compressed air on a specially built frame. A vibrator core bench for making small cores by the multiple system will be shown and girl operator will demonstrate the machine; represented by G. B. Pickop, also H. J. Felsburg of J. Jacob Shannon Co.

MARDEN, ORTH & HASTINGS CORP., New York.—The booth occupied by this company will be fitted up as a reception room. Cores made by the liquid and powdered sand binder manufactured by this company and samples of these materials will be shown; represented by H. M. Handy.

MASON, ARTHUR C., INC., Hawthorne, N. J.—The high speed, quick change sensitive bench drill manufactured by this company will be exhibited; represented by C. A. Widmer, Arthur C. Mason and William Reynolds.

MAXON-PREMIX BURNER CO., Muncie, Ind.—Fuel burners will be exhibited.

MERCURY MFG. CO., Chicago.—

METAL INDUSTRY, New York.—The booth occupied by this company will be fitted out as a rest room; represented by P. H. Langdon, Adolph Bregman, G. W. Cooper, T. A. Trumbour and H. C. Burr.

METAL & THERMIT CORP., New York.—Transparencies and photos showing various applications of thermit for welding and demonstrating the use of thermit for pipes, will be displayed. Heating cans for foundry work and small welds will be exhibited; represented by W. R. Hulbert, A. F. Braid, H. G. Spilsbury, J. G. McCarty and H. D. Kelley.

METALLIC ABRASIVES MANUFACTURERS' ASSOCIATION OF AMERICA, Pittsburgh.—Metallic abrasives for sand blasting will be exhibited; represented by G. H. Kann, Pittsburgh Crushed Steel Co.; N. C. Harrison, Harrison Supply Co.; H. M. Ream, Globe Steel Co.; I. A. Diamondstone, Harrison Bros., Inc., and R. S. Kann, Pittsburgh Crushed Steel Co.

MICHIGAN SMELTING & REFINING CO., Detroit, Mich.—Nonferrous metal products including ingot, brass and bronze, solders, babbitt metals, lead pipe, brazing spelter, etc., will be exhibited; represented by R. H. Evans, Norman Stillman, Maj. F. C. Bahr, Henry Levitt, C. T. Bragg, R. R. Arnold and William W. Eitel.

MIFFLIN CHEMICAL CORP., Philadelphia.—Samples of the core binder made by this company and cores produced by the use of this binder will be exhibited; represented by Phillip Publicker, Harry Cohen and W. J. Lehman.

MILBURN, ALEXANDER, CO., Baltimore.—Oxy-acetylene welding and cutting apparatus, including an acetylene welding generator, combination welding and cutting torches, welding torch operating on equal pressures of oxygen and acetylene, a lead-burning apparatus, portable carbide lights ranging in size from 1000 to 15,000 candlepower and a light and heating burner which uses kerosene oil; represented by A. F. Jenkins.

MINE & SMELTER SUPPLY CO., New York.—A Wilfley table of laboratory size will be shown in operation; represented by E. S. Tompkins.

MONARCH ENGINEERING & MFG. CO., Baltimore.—The following furnaces will be exhibited by this company: Four types of noncrucible furnaces including a double chamber furnace, a vertical furnace and a rotary furnace; a tilting coke-fired furnace with crucible; a tilting oil-fired furnace with crucible; three oil-gas and coke-fired core ovens; a ladle heater and a stationary oil or gas-fired steel furnace; represented by H. D. Harvey, James J. Allen, Frank P. Maujean and William Raber.

MONARCH MACHINERY CO., Philadelphia.—The following machines will be exhibited: A 32-inch shaper; several types of heavy duty and high-speed drill presses, two types of milling machines, and an engine lathe; represented by Edwin R. Mack, Austin H. Campbell, Robert L. Arms, Henry M. Shaw, Andrew J. Berger, A. W. Heppard and E. W. Stegman.

MOTT SAND BLAST CO., New York.—A sand blast barrel will be shown in operation. In addition a late type of cloth screen dust arrester will be operated and a complete line of accessories, such as hose, helmets, nozzles, gloves, etc., will be shown; represented by David Mayer, E. J. Rosenthal, E. C. Gilmour and R. E. Donnelly.

MUMFORD MOLDING MACHINE CO., Chicago.—A new combination jolt split pattern molding machine fitted with automatic, slow-start oil pattern draft cylinder, controlled by a knee valve will be exhibited. This machine is designed to give a smooth, slow start for the first three-quarters of an inch with a rapid finish for the balance of the pattern draw, thereby leaving the operator's hands entirely free to pick up the mold the instant the pattern is drawn; represented by P. W. Gates, James T. Lee, O. F. Weiss and J. O. Clark.

NAPIER SAW WORKS, Springfield, Mass.—A motor-driven horizontal band saw will be shown in operation; hack saws made by this company also will be exhibited; represented by A. C. Whitefield and H. M. Reynolds.

NATIONAL ENGINEERING CO., Chicago.—Three sand mixers varying in size from 3 to 6 feet in diameter will be exhibited. The 6-foot machine will be in operation during the convention and will mix facing sand, core sand and other mixtures; represented by H. S. Simpson.

NICKOLLS, WILLIAM H., CO., New York.—

NEW CHICAGO CRUCIBLE CO., Chicago.—Graphite crucibles manufactured by this company will be exhibited; represented by Dr. Sherman Taylor, Adolph Hottinger, LeRoy C. Taylor, James Foraker, J. W. Mann and John Kroll.

NORMA CO. OF AMERICA, New York.—Ball bearings manufactured by this company for use in frac-

tional horsepower electric motors, high speed grinders, portable electric drills, high speed sensitive drill presses, etc., will be exhibited; represented by Norman Bell, Arthur Meder, D. E. Batesole and George R. Bott.

NORTON CO., Worcester, Mass.—This company will exhibit the following: One 6 x 32-inch plain cylindrical grinding machine; one 2-inch floor stand; one 1¼-inch floor stand; one ¾-inch bench machine, motor driven; one universal tool and cutter grinder; and various grinding wheels for use in the foundry and an exhibit of tool and cutter grinding wheels. Polished stove parts ground by abrasives made by this company also will be shown; represented by S. A. Craig, W. R. Strong, E. F. Anderson, Herbert Duckworth, Wallace T. Montague, E. W. Barnes and C. H. Wood.

OAKLEY MACHINE TOOL CO., Cincinnati.—The universal cutter and tool grinder manufactured by this company, equipped with power feed, wet grinding attachment and motor drive will be operated; represented by Abbot A. Thayer.

OBERMAYER, S., CO., Chicago.—This company will exhibit a sprue cutter, tumbling barrel, ladles, and other small foundry equipment. The use of a furnace cement manufactured by this company will be demonstrated in a small electric furnace; represented by S. T. Johnston, E. D. Frohman, J. L. Cummings, William Fitzpatrick, J. J. McDevitt, W. J. Adams, I. D. Adams, J. E. Evans, O. J. Peterson, O. C. Olson, C. M. Barker and William Fenton.

OHIO BLOWER CO., Cleveland.—This company will exhibit a portable core oven complete, a section of a rack type and truck type oven showing corners and door construction; rotary ball bearing ventilators; air separators, and air traps; represented by David Johnson, George Thomson, Herbert Brandt, Thomas Whitaker, Eugene Van Note and H. A. Bogardus.

OLDHAM, GEORGE, & SONS CO., Frankford, Philadelphia.—Chipping hammers, foundry rammers and core busters will be exhibited by this company; represented by Messrs. Fraser and Biles.

OLIVER MACHINERY CO., Grand Rapids, Mich.—A complete pattern shop will be operated by this company. All of the following machines will be operated: A universal wood milling machine; a vertical disc and spindle sander; two types of hand planer and jointer; a universal bench saw; a combined band re-saw and scroll saw; a band sawing machine; a pattern maker's lathe; two types of wood trimmers, a revolving oil stone tool grinder; a pattern maker's bench; a type embossing press; a surface planer; an extra heavy duty engine lathe; a tool room engine lathe, and a die filing machine. Complete patterns will be turned out from this shop during the convention; represented by R. F. Baldwin, Arthur Blake, J. Ray Bate, G. C. Conklin, C. R. Crossley, Dolph De Young, C. A. Ginter, J. E. McLauchlen, Arle Steenbergen and A. S. Kurkjian.

OXWELD ACETYLENE CO., Newark, N. J.—This company will exhibit and make practical demonstrations of oxyacetylene cutting and welding apparatus; represented by W. E. Cotter, W. B. Wilson, V. L. Mauhowt, G. R. Mitchell and F. W. Smith.

PANGBORN CORP., Hagerstown, Md.—The exhibit of this company will be more extensive than in previous shows. The equipment, which will be in operation, will include cabinet sand blasting outfits, barrel sand blasts, rotating table cabinet and plain rotating table apparatus, hose machines, sand separators, dust arresters and exhausters. Actual installations made by the Pangborn Corp. will be shown by a stereopticon machine; represented by Thomas W. Pangborn, John C. Pangborn, Harry D. Gates, W. C. Lytle, P. J. Potter, George A. Cooley, Charles T. Bird, Jesse J. Bowen, Roy C. Koch, J. F. Tracey, T. R. Ditty, Hugo F. Liedtke and Foster J. Hull.

PAXSON CO., J. W., Philadelphia.—Products manufactured by this company, including foundry facings, foundry sands, gravels and clays and other supplies and equipment will be exhibited; represented by H. M. Bougher, Howard Evans, S. C. Bougher, H. J Bougher, F. B. Platt, J. S. Hibbs, A. G. Warren, John S. Gilbert and I. F. Kremer.

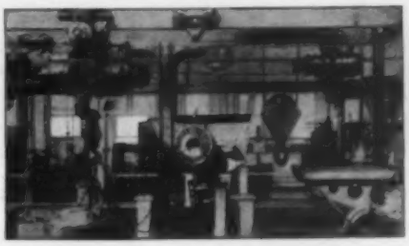
PENTON PUBLISHING CO., Cleveland.—This booth will be fitted up as a rest room for visitors where all are invited to make their headquarters; represented by John A. Penton, A. O. Backert, J. D. Pease, H. Cole Estep, G. O. Hays, E. L. Shaner, H. E. Diller, D. M. Avey, Pat Dwyer, Charles Vickers, J. P. Ahrens, F. V. Cole, H. O. Taylor and Paul R. Fisher.

PETTINOS, CHARLES E., New York.—Foundry sand suitable for steel, gray, iron, brass, bronze and aluminum castings, plumbago for various uses, and graphite will be shown; represented by Charles E. Pettinos, M. M. Housekeeper, J. H. Bing, Martin Meiss and W. H. Laros.

PETTINOS, GEORGE F., Philadelphia.—The booth occupied by this company will be fitted up as a reception room; represented by George F. Pettinos and H. B. Taylor Jr.

PHILADELPHIA GREASE CO., Philadelphia.—Various grades of the grease made by this company for lubricating all classes of machinery and especially pneumatic tools will be exhibited; represented by Messrs. Dean, Maloney, White and Horace A. Smith.

PICKANDS, BROWN & CO., Chicago.—This company will exhibit by-product coke in conjunction with the Semet-Solvay Co. The front of Independence hall, Philadelphia, will be reproduced in a structure of coke, the top of the tower reaching about 15 feet above the floor. George A. T. Long, whose work with coke has attracted considerable attention at previous shows, will erect this year's exhibit; represented by Thomas W. Glasscot, James A. Galligan,



AT THE CHICAGO EXHIBIT, 1914

James A. Ballard, William H. Ball and George A. T. Long.

PITTSBURGH FURNACE CO., Milwaukee.—Photographs of the electric furnace installed by this company in steel mills and steel castings plants will be displayed; represented by J. F. Dirnuweit and E. V. Kane.

PORTAGE SILICA CO., Youngstown, O.—This company will exhibit photographs of its plant and samples of silica rock in its natural state and of the finished sand produced from it; represented by E. E. Kloor and L. R. Farrell.

PRIDMORE, HENRY E., Chicago.—A number of molding machines, including a plain electric jolt machine, a jolt strip and jolt roll-over machine, a hand roll-over machine and a hand stripping plate machine will be exhibited; represented by Mrs. Henry E. Pridmore, H. A. Pridmore, George Furman, H. G. Schlichter, D. F. Eagan, C. H. Ellis, J. W. Dopp, Hugh Gallagher and Marshall E. Pridmore.

PROVIDENCE GAS CO., Providence, R. I.—This company will exhibit foundry coke; represented by C. H. Tholl, M. B. Beck and W. G. Rich.

QUIGLEY FURNACE SPECIALTIES CO., New York.—A refractory material for bonding fire brick will be demonstrated. Temperature tests on this material will be made by means of electric furnaces and various metallurgical applications of this material will be illustrated. A refractory fire sand for making rammed-in linings, special tile and for repairing furnace structures will also be shown. A powdered coal system for preparing, transporting and burning powdered coal will be featured; represented by W. S. Quigley, J. H. McPadden, L. G. McPhee, H. M. Miller, C. E. Pullum, George R. Powell, C. E. Klein, F. W. Reisman, S. D. Enoch and F. G. Wensel.

RACINE TOOL & MACHINE CO., Racine, Wis.—Three types of the high-speed metal cutting machines made by this company will be exhibited. The tools exhibited will be of 6 x 6-inch, 8 x 8-inch and 12 x 15-inch capacity respectively. A 6 x 6-inch machine will be operated and a high-speed rail cutting machine will be shown; represented by A. H. Goetz, E. R. Larson, T. A. Hyde, D. B. Maxwell, Ralph Maxwell, N. R. Petersen, F. J. Kidd and William Reinhardt.

RAILWAY MECHANICAL ENGINEER, Chicago.

RAINEY, W. J., Philadelphia.—Samples of Connellsville beehive and rectangular oven foundry coke and photographs of a number of operations producing this grade of fuel will be shown. By-product foundry and furnace coke and photographs showing the erection and operation of a by-product plant at Swedeland, Pa., will be shown; represented by A. F. Kempe, R. I. Willcox, H. B. Prescott and W. H. Vermilya.

REPUBLIC CREOSOTING CO., Indianapolis.—Exhibits of interior wood-block floor installations will be featured; represented by H. G. Stephens and G. Nelson.

RICH FOUNDRY EQUIPMENT CO., Chicago.—(See Sand Mixing Machine Co.)

RICHARDS-WILCOX MFG. CO., Aurora, Ill.—This company will exhibit overhead carrying systems including trolley and I-beam types of monorail tracks with switches, cross-overs, turntables, trolleys, etc. A traveling crane and hoists will be shown; represented by A. J. Eggleston and E. J. G. Phillips.

ROBESON PROCESS CO., New York.—Cores bound with the core binder manufactured by this company will be exhibited; represented by G. I. Lindsay, C. A. Rapallo, T. J. Ryan and T. J. O'Hara.

ROGERS, BROWN & CO., Cincinnati.—This company will exhibit samples of foundry coke, alloys, pig iron and fluor spar. Finished iron castings of intricate design produced from these materials will be shown and in addition, a 12-cylinder Liberty motor loaned through the courtesy of the Lincoln Motor Co., Detroit, and especially constructed by it as a permanent exhibit at the Smithsonian Institute, Wash., will be exhibited; represented by S. W. Hubbard, T. A. Wilson, A. O. Sonne, H. W. Fernald, F. E. Fitts, R. W. Clark, J. A. Claussen, George R. Sullivan, Richard Peters Jr., S. B. Morrison, H. B. Carson, F. J. Waldo, A. F. Stengle, F. W. Bauer, A. J. Wentworth and J. R. Morehead.

ROOTS CO., P. H., & F. M., Connersville, Ind.—A number of the smaller blowers manufactured by this company will be exhibited, including the first blower ever constructed by the P. H. and F. M. Roots Bros., 60 years ago; represented by E. D. Johnston and H. M. Papworth.

SAND MIXING MACHINE CO., New York.—This company will exhibit the following products of the Sand Mixing Machine Co., the American Foundry Equipment Co. and the Rich Foundry Equipment Co., which recently were combined and now operate under the name of the American Foundry Equipment Co.: An auto sand cutter designed to cut, mix and pile sand on molding floors a rotary sand blast table room; a gravity feed barrel; an annealing oven truck, and a core making machine; represented by V. E. Minich, Elmer A. Rich Jr., Hutton H. Haley, John D. Alexander, Charles G. Smith, Jerome E. Sweet and C. B. Schneible.

SELLERS, WM., & CO., INC., Philadelphia.—This company will exhibit a centrifugal sand mixing machine, belt and motor driven; a motor-driven universal tool grinding and shaping machine, and a motor-driven twist drill grinding machine; represented by Edward L. Hollies, Charles T. Wilson and Stephen A. Smith.

SHEPARD ELECTRIC CRANE & HOIST CO., Montour Falls, N. Y.—This company will erect a special structure of which various types of hoisting equipment will be exhibited. Among the types of hoisting apparatus shown will be a standard crane trolley operated by controllers from the floor; a cage operated hoist with an electric magnet; two standard types of floor operated hoists and a new type of electric cargo winch. This winch, which will be shown in operation, consists of a cast base upon which is mounted a back geared motor with a special drum and winch head. The head is so arranged that it works independently of the drum, so that the load may be held stationary at any point by means of ratchet and pawl while the boom is either raised or lowered or swung around by the winch

head. The power is furnished through a standard slow speed crane motor and a double gear train of internal gears; represented by W. C. Briggs, R. W. Hurst, F. E. Meeks, R. J. Wadd, N. P. Farrar, D. B. Patterson, H. W. Gledhill, John Jackson, W. C. Minier, G. N. French, Walter B. Briggs, R. H. McGredy, A. J. Barnes and John Guyer.

SIMONDS MFG. CO., Fitchburg, Mass.—Saws for cutting various kinds of metal will be exhibited and a metal saw sharpening machine will be demonstrated; represented by H. B. McDonald and Spencer Patterson.

SKINNER BROS. MFG. CO., St. Louis.—A motor-driven 4 x 4-foot heater for heating foundries and industrial plants will be shown in operation. Represented by E. C. Evans, C. V. Haynes, Mr. Sewell.

SLY, W. W., MFG. CO., Cleveland.—This company will exhibit the following: A sand blast mill; a turntable cabinet complete with sand and dust elevating and separating system; a hand sand blast cabinet; a sand blast cage; a tumbling mill; a resin mill; a sand blast pressure tank, and photographs and sand blast test plates; represented by W. C. Sly, George J. Fanner, E. J. Moore, P. W. Graue, D. E. Hadley and S. H. Baird.

SMITH, R. P., & SONS, Chicago.—Safety shoes for molders and foundrymen will be exhibited; represented by J. B. Smith Jr.

SMITH, WERNER G., CO., Cleveland.—Samples of the core oils made by this company will be displayed along with specimens of cores and castings made from these products; represented by Werner G. Smith, Frank H. Dodge, L. P. Robinson, M. S. Finley, W. E. Rayel, F. K. Sawyer, J. C. DeVenne and L. F. Ferster.

SPENCER TURBINE CO., Hartford, Conn.—A 15-horsepower turbine compressor for use in supplying air for cupolas will be exhibited; represented by H. M. Grossman and S. E. Phillips.

STANDARD SAND & MACHINE CO., Cleveland.—This exhibit will consist of a motor-driven sand mixer; represented by Harry E. Boughton.

STANDARD SHOP EQUIPMENT CO., INC., Philadelphia.—Standard methods and standard equipment for properly setting up work on machine tools will be displayed. The following appliances will be shown: T-head steel slot bolts, double and single end clamps, packing and step blocks, nuts and washers, bolt spacers and drop forge wedgers; represented by H. J. Stites and M. M. Sarben.

STERLING WHEELBARROW CO., Milwaukee.—Foundry flasks, wheelbarrows, core barrows, etc., will be exhibited. A feature of the exhibit of this company will be samples of very large flasks, complete with intricate bars; represented by I. R. Smith, H. H. Baker, A. E. Welch, J. J. Coyne, H. Kalthoff, R. F. Jordan, George H. Lambkin, Charles L. Kirk, J. W. Dopp and J. M. Patterson.

STRAUSS & BUEGELEISEN, New York.—This exhibit will consist of laminated glass manufactured by this company, welding goggles and goggles for all hazardous operations in the foundries; represented by M. Walter, L. V. Siegel, D. and J. Buegeleisen.

SULLIVAN MACHINERY CO., Chicago.—This company will operate a 14 x 8¼ x 10-inch angle compound belt-driven air compressor at 50 revolutions per minute with a displacement of 445 cubic feet of air per minute. The machine will be driven by a 75-horsepower General Electric motor, and will compress air for other exhibitors at the show. A 10 x 10-inch straight line single-stage belt-driven compressor equipped with a new design of plate valve, also will be exhibited; represented by Arthur E. Blackwood, J. B. Pratt and Alexander Milne.

SWAN & FINCH CO., New York.—Cores in which the core oil manufactured by this company has been used will be exhibited; represented by Richard Thackray, Edward F. Ryan, Mr. Chamberlin, C. G. Howe, C. B. Lamson, T. P. James, George J. Graham, J. A. Ellis and H. J. Waldron.

SWIND MACHINERY CO., Philadelphia.—This company will exhibit an 18-inch x 8-foot geared head lathe; a heavy-duty drill; a sheet metal cutter and an internal grinding machine. All of these machines are motor driven; represented by L. H. Swind, J. E. Brandt, W. J. Powers, M. R. Carson and D. M. McCracken.

TABOR MFG. CO., Philadelphia.—The exhibit will include plain power squeezer, combination jarring squeezer, power squeezing split pattern, jarring squeezing split pattern, plain jarring machine, jarring and roll over, hand ramming roll over, and jarring stripping plate types of molding machines. A saw and milling cutter also will be exhibited; represented by Wilfred Lewis, H. W. Brown, J. T. Ramsden, J. H. Coleman, H. W. Impey, W. E. Sewell, D. J. Martin, John Fendner, E. S. Lewis, Jacob Degler, Philip Shire and T. L. Sumner.

THOMAS ELEVATOR CO., Chicago.—Wrenchless chucks and drill press vises will be operated; represented by Messrs. Moorse, Cassell and Bolduck.

THOMAS IRON CO., Hokendauqua, Pa.—Samples of pig iron, ore and castings in which these materials have been used will be exhibited; represented by Philip E. Wright.

THOMPSON, LEWIS, & CO., INC., Philadelphia.—Several patterns made from mahogany many years ago will be shown by this company to demonstrate the quality of this wood; represented by Charles H. Thompson Jr. and L. P. Bransford Jr.

TRUSCON STEEL CO., Youngstown, O.—The exhibit will consist of pressed steel foundry flasks; a pressed steel platform for lift trucks; photographs and layouts of various types of industrial buildings, and side wall steel windows, top hinge continuous monitor steel sash and a tension operating device; represented by G. F. Danielson, G. F. Bateson, C. I. Anten, H. W. Jencks, G. F. Sparks and C. W. Close.

UNITED COMPOUND CO., Buffalo.—Vent wax and pattern wax will be exhibited; represented by John W. Bradley and L. F. Leney.

UNITED STATES GRAPHITE CO., Saginaw, Mich.—The booth occupied by this company will be fitted up as a rest room. Graphite and graphite products will be displayed; represented by R. A. Corrigan, J. G. Drought, F. B. Godard, H. F. Gump and G. D. Robinson.

U. S. MOLDING MACHINE CO., Cleveland.—The following machines will be exhibited: A plain air squeeze machine; combination jolt and squeeze machine; a combination jolt squeeze pattern draw machine; combination jolt squeeze stripping plate machine; a combination jolt stripping machine; a jolt roll over core machine, and a plain air jolt machine. These machines will be shown in operation; represented by J. N. Battenfeld, J. L. Battenfeld, C. F. Battenfeld and J. L. Murdock.

UNITED STATES SILICA CO., Chicago.—Samples of an abrasive for sand blasting and a form of silica for steel molding and core making; also samples of castings produced by these materials will be exhibited; represented by Volney Foster, Lewis B. Reed, H. F. Goebig and Oliver Cook.

VANDYCK-CHURCHILL CO., Philadelphia.—This company will exhibit a 3-foot sensitive radial drill with tapping attachment arranged for belt drive; a 5-foot triple purpose, plain arm, high duty radial drill equipped with speed-box and arranged for belt drive; a 3-foot triple purpose, high speed radial drill, motor driven; a 24-inch shaper, motor driven; a 16-inch tool room lathe, with complete equipment, belt driven; a 20-inch x 10-foot lathe, motor driven; a 30-inch x 30 x 8-foot planer, belt driven. These tools are manufactured by the American Tool Works Co., Cincinnati. The Vandyck company also will exhibit a motor-driven multiple milling machine made by the Kempsmith Mfg. Co., Milwaukee; a 16-18-inch motor-driven turret lathe, manufactured by the International Machine Tool Co., Indianapolis; a motor-driven universal grinder made by the Oakley Machine Tool Co., Cincinnati; a motor-driven cold saw manufactured by the Higley Machine Co., South Norwalk, Conn.; an exhibit of geometric threading tools manufactured by Geometric Tool Co., New Haven, Conn. As far as possible, the machines will be demonstrated on work; represented by C. M. Hamersly, Charles F. White, A. C. L. Black, J. K. Robson, George Crawshaw.

VIBRATING MACHINERY CO., Chicago.—This company will exhibit an electrically operated sand sifter and a gas unit for welding and cutting iron and steel with artificial or natural gas; represented by J. Schroeter, J. C. Miller and William Lindsay.

WILSON, T. A., & CO., Reading, Pa.—The booth occupied by this company will be equipped as a rest room for foundrymen. Safety goggles will be displayed; represented by M. C. Rider, E. A. Wagner, G. D. Richardson and N. Ray Miller.

WADSWORTH & CO., Cleveland.—Working models of tractor, crane and screen types of the new sand cutting machine being built by this company will be exhibited; represented by H. L. Wadsworth, George W. Beyerle and John L. Lake.

WADSWORTH CORE MACHINE & EQUIPMENT CO., Akron, O.—This company will exhibit a bushing core making machine; two motor-driven core cutting off and coning machines and steel reinforced core trays and bottom plates; represented by George H. Wadsworth and M. C. Sammons.

WALLACE, J. D., & CO., Chicago.—Woodworking machines including planers and complete equipment for a modern pattern shop will be shown; represented by J. D. Wallace and H. L. Ramsey.

WARNER & SWASEY CO., Cleveland.—This exhibit will consist of a universal hollow hexagon turret lathe operating on gear blanks and a universal screw machine operating on a special design of screw; represented by L. K. Berry, E. R. Gardner, H. E. Yeager and W. L. Loegler.

WESTINGHOUSE ELECTRIC & MFG. CO., East Pittsburgh, Pa.—Electrical equipment for foundries and machine shops, including steel-clad electrical heating devices for heating pattern plates, will be exhibited. The heaters are mounted in the space below the plates within the framework of the molding machine. A 500-ampere arc-welding motor generator set, with control panel and accessories, also will be exhibited. Industrial motors, starters and controllers, meters, fans, etc., will be displayed.

WHITE & BRO., INC., Philadelphia.—Nonferrous metals of all kinds including casting copper, electrolytic copper, composition and bronze ingots, yellow brass ingots, manganese bronze, babbitt metals and other white metals; represented by Frank Krug, Raymond Hunter, Gillis Arsenault, G. Horace Krider, J. C. Ashmeads, F. A. Reinhardt, Harold F. Reinhardt and Ray Galbraith.

WHITEHEAD BROS. CO., New York.—The booth occupied by this company will be fitted up as a rest room; represented by Alfred J. Miller, Charles E. Andrews, Andrew Y. Gregory, Alexander Haigh, V. L. Whitehead Jr., R. L. Cleland, J. T. Kelly, R. J. Hashagen, T. F. Hogan and J. H. Whitehead.

WHITING FOUNDRY EQUIPMENT CO., Harvey, Ill.—This company will exhibit an operating model of a crane trolley; a round steel plate tumbling barrel; a turntable with grooved tracks; a 2-ton charging car; a 2-ton worm geared crane ladle and photographs and drawings of installations made by the company; represented by R. H. Bourne, A. H. McDougall, W. R. Hans and R. S. Hammond.

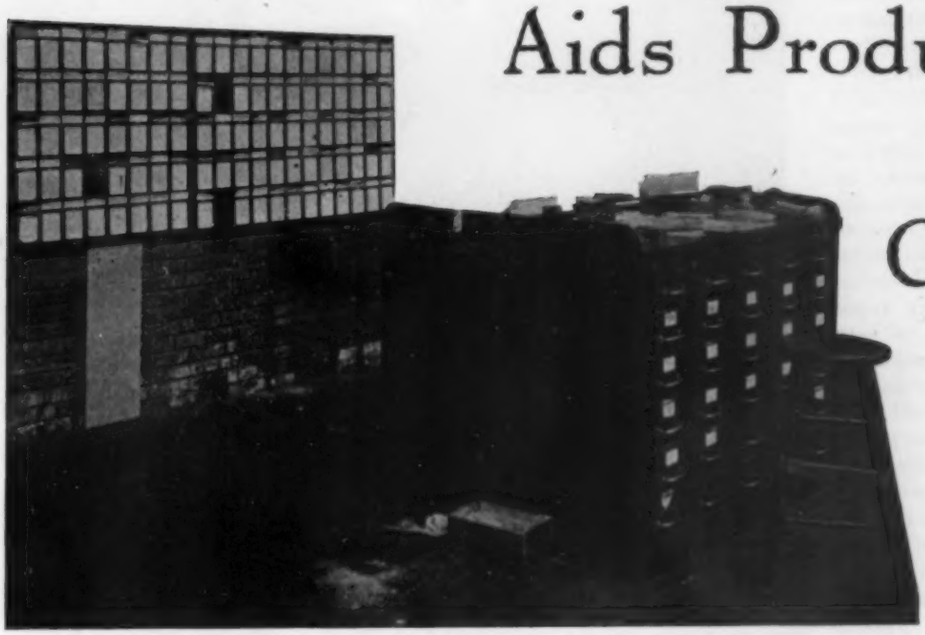
WHITMAN & BARNES MFG. CO., Akron, O.—This company will demonstrate a patented twist drill; represented by George Hine, R. A. Ammon, A. A. Williams and Ralph Templeton.

WOOD'S, T. B., SONS CO., Chambersburg, Pa.—Equipment used in connection with the system of taper snap molding employed by this company, including taper snap flasks and automatic snap jackets will be exhibited. A flask will be operated in connection with a power squeezer machine; represented by Charles M. Wood and Victor Lesher.

WOODISON, E. J., CO., Detroit.—Various types of molding machines, core machines and core oil, snap flasks, mold jackets and other foundry supplies will be shown; represented by E. J. Woodison, C. H. Woodison, J. C. Woodison, G. A. Burman, J. F. Webb, W. H. Muir, W. J. Wark, R. W. Davidson, J. M. Witters, M. A. Bell, R. S. Hoffman, W. H. Haggman, W. M. Burroughs, E. A. Mead, W. M. Maybank, H. T. Taylor, F. F. Shortsleeves, M. M. Werckman, D. D. Baxter, H. M. Chamberlin, J. W. Shotts and M. T. Thomson.

YOUNG BROTHERS CO., Detroit.—An oven compartment equipped with gas and electric heat will be exhibited. The method of heating by oil or coke also will be indicated. This oven will be arranged to handle cores on lift racks by means of a hand or power lift truck; represented by George A. Young, R. B. Reed, G. G. Parry, T. P. McVicker, W. C. Wagner and A. H. Ackermann.

Efficient Planning and Routing Aids Production in New Cleveland Plant



BY E. W. KREUTZBERG

Fig. 1—Foreman's Desk in Automatic Department. Each Compartment in the Board on the Wall Represents a Machine

IN MANUFACTURING large quantities of small parts, production depends largely upon the ease and rapidity with which the work progresses through its various stages from raw material to the finished product. Experience has proved that in order to insure the steady movement of pieces from one operation to another, each job must be carefully studied before work on it is commenced so that every detail affecting its execution may be anticipated. Once a schedule of operations has been intelligently worked out, it serves as a time table on which the production department and the foreman of the various operating units may depend in handling the job.

Routing, which is the dispatching of work from one machine or department to another, goes hand in hand with planning. Efficient routing is impossible if the operations required to finish a job are not properly planned in advance. On the other hand, the most elaborate planning system is worthless unless it is accompanied by an adequate method of routing.

An unusually good example of a plant in which carefully planned work is efficiently routed is found in the recently completed Coit road works of the National Acme Co., Cleveland. The plant is devoted exclusively to the manufacture of the products of automatic screw machines and allied secondary operation equipment, the average monthly output being in excess of 50,000,000 pieces. The problem of maintaining a satisfactory organization to handle this large production is complicated by the fact that a great many orders of widely varying sizes are executed, involving small parts of many different designs. In planning and routing work it is necessary to consider the capacities of the 1800 machines in the plant, including automatic screw machines, bolt threaders, screw slotters, drillers, grinders, milling machines, second-operation machines,

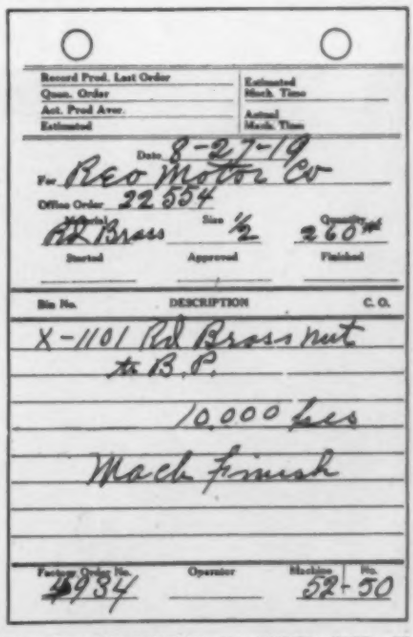


FIG. 2—REPRODUCTION OF TICKET USED IN THE BOARD SHOWN IN FIG. 1

etc. Allowance also must be made for handling a large proportion of the total output of the plant in a heat-treating department which accommodates among other pieces, 250,000 nuts daily and consumes 900 gallons of fuel oil.

The automatic machine products are made exclusively from brass, steel and iron bars which are unloaded from railroad cars and carried on electric trucks to a spacious stock room, 80 feet wide, extending across the full length of the southern bay of the plant. The machines are arranged so that the work of smallest diameter is performed in the eastern portion of the shop, the size of the work increasing progressively in each battery of machines from east to west. The bar material in the stock room is stored in a similar manner, with the small sizes in the east and the largest in the west end of the department. The bars are stacked in racks consisting of horizontal steel beams in which adjustable vertical metal posts, which serve as partitions, are fastened. The bar stock is handled by electric hoists manufactured by the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., which run on an overhead monorail system and are equipped with specially designed metal slings for handling the bars. The storage racks and one of the hoists are shown in Fig. 5.

All of the work which passes through the shop is classified as stock or special jobs. Stock jobs comprise the work of standard design, such as bolts, nuts,

screws and studs, which can be finished and stored in anticipation of actual orders. Special jobs are those resulting from orders to customer's sample or blueprint and for which machines must be specially tooled to produce. The designs of a number of representative jobs are shown in Fig. 19.

When an order is received, proper record of it is made in the office of the works manager and a sample of the required piece or a blueprint with specifications is sent to the estimating department in the northeast corner of the plant, adjacent to the offices of the works superintendent and chief inspector. The estimators calculate the speed at which the job can be handled, decides upon the size and type of machine best fitted to do the work and determine the amount of metal, in pounds, required to complete the order. The preliminary survey of the job made by the estimators forms the basis of cost estimates worked out in the cost department.

From the estimators the sample or blueprint goes to the chief inspector who examines its different dimensions, threads, drilled holes, knurls, etc., and orders the required complement of gages to be used by machine operators and departmental inspectors. He also must study the job carefully, anticipating irregularities which might lead to rejection of work.

The sample or blueprint next goes to the general foreman who confers with the departmental foremen upon the method of handling the job. They decide what tools are required, issue the proper orders and send the sample or blueprint, with necessary directions, to the tool room.

Forming tools play an important part in the work of automatic machines. These, together with an adequate complement of tools for each operation, are made in the tool room and delivered to the foreman of the automatic department. After each job is completed, the tools, gages, samples of the work, and the production record are assembled and filed in a specially designed metal rack where it remains for five years.

When a job is received in the automatic department, a card similar to that shown in Fig. 2 is made out. White cards are used for stock jobs and pink cards for special jobs. When the work is assigned to a machine, the card for the job is placed in the compartment of the wall rack shown in Fg. 1 corresponding to the number of the machine. The rack serves as an indicator of the working status of the machines. The three empty compartments appearing in Fg. 1 indicate that only three machines are idle.

As soon as a job has been assigned to a machine, the sample or blueprint and the tools are turned over to the lineman who has charge of the machine. Linemen are experienced mechanics who are familiar with every detail regarding the operation of automatic machines. Each lineman is in charge of a line or battery of machines and is responsible for setting up machines for jobs and making repairs and adjustments. The time required for rigging up an automatic for a special job varies according to the intricacy of the work. When the lineman has adjusted tools and speeds until he can accurately reproduce the sample or conform to the blueprint in quantities corresponding to the speed designated by the estimator, he takes a finished piece and delivers it to the departmental inspector. When he has examined and O. K.'d the sample, the machine is turned over to an operator who is responsible for maintaining production at the prescribed rate until the job is finished.

Each evening a night gang takes the day's run from the machines and replenishes the supply of oil for the next day. The work, which is mixed with turnings, is scooped up into pails by means of specially shaped hoes and carried on electric trucks to the cleaning department. A tin ticket bearing the number of the department and the machine is placed in each pail. In the cleaning department the pails are piled together without any attempt at classification, the tickets in the buckets being relied upon to do this later. The oil is first removed in centrifugal extractors. The dry mass of metal next is placed on a sifter whose inclined screen and jarring action causes the automatic products to gradually slide down the sloping screen into steel boxes at the foot. Most of the scrap in the form of tiny chips, falls through the sifter into boxes to be later dumped into trucks. Drillings and borings are too

FIG. 4—EXTERIOR VIEW OF THE COIT PLANT OF THE NATIONAL ACME CO., CLEVELAND, WHERE

FIG. 3—PRODUCTION BOARD IN THE CLEARING DEPARTMENT

PRODUCTS ARE TURNED OUT AT THE RATE OF MORE THAN 50,000,000 PIECES MONTHLY

large to pass through the mesh of the screen and are easily removed by the workman in charge of the apparatus. The power sifter is clearly illustrated in Fig. 6.

The work, free from turnings, is subjected to a steam bath in specially designed washing machines made by G. S. Blakeslee & Co., Chicago. Each of these machines consists of a moving, electrically-operated conveyor and two tanks. Workmen place the products, still in the steel boxes in which they left the power sifters, on the conveyor which carries them into the first of the two tanks where they come in contact with a boiling solution of soda, alkali and water. The boxes next enter a rinsing bath which removes final traces of oil from the products. The boxes are removed from the conveyor, sprayed with thin oil to prevent rust and placed on trucks which carry them to the assorting department, shown in Fig. 12. Here the remaining scrap, consisting of bar ends, etc., is removed.

Progress of Work is Checked

Many of the products of the Acme company cannot be completed on one automatic screw machine and must go to other machines for supplementary operations. The clearing department, which receives the cleaned pieces from the assorting department, is responsible for routing unfinished products to the proper machines for completion. A close check is kept on the progress of each job by means of the production board shown in Fig. 3, which provides for a record of the work of every machine in the automatic department. The large numbers in a column on the left hand side of the board indicate machine departments, while the smaller numbers, in horizontal row, represent the machines. Small hooks in the board support tickets and samples of the work. Each ticket bears information regarding the progress of the work while the finished piece aids the clearing department in tracing the order.

The products of each day's run are weighed, the number of pieces being determined by weight rather than by actual count. As each pail is weighed, the tin ticket which has been previously mentioned, is removed and a white paper ticket bearing the number of the machine, the number of the department and the name of the firm for which the job is being done, is put in its place. The tin tags, having served their purpose, are returned to the automatic departments. The weight of the finished product, as determined in the clearing department, is subtracted from the weight of the bar stock used for the order, and the difference, which represents the scrap, is credited to the customer.

If the weighing of a day's run shows that production on an order is falling behind, the clearing department refers to the production board which shows at a glance which machine is behind in output. The foreman in charge of the automatic is notified of the shortage and provision is made for increasing the output.

The shipping department, a portion of which is shown in Fig. 15, is in the north side of the plant adjoining the clearing department. The finished products are carried to the shipping room in large electric trucks.

A small portion of the special work going through the plant requires polishing in addition to the regular first and secondary operations and for this class of products a special department has been established, comprising a number of vertical polishing machines, as shown in Fig. 9, and additional units of different sizes and shapes. Bolt heads, nuts, screws, etc., which require polishing, case-hardening, etc., pass through the clearing department as in the case of products direct from the machines.

Many of the nuts and screws are case-hardened before they enter the stock room. A battery of case-hardening furnaces, made by Strong, Carlisle & Hammond Co., Cleveland, is shown in Fig. 7. As the automatic products come from these furnaces, they are quenched by means of the apparatus shown in Fig. 8.

Oil Drains From Scrap

About 50 tons of turnings are produced daily from the automatics and nut and special operation machines. This is hauled out of the plant in big dump trucks similar to that shown in Fig. 6, and deposited in a large concrete pit in the rear of the plant. Here it remains for a day or two until practically all of the oil still remaining in it drains into a tank underneath the bin. The scrap is then loaded into cars by means of a locomotive crane made by the Orton & Steinbrenner Co., Chicago.

The Coit plant of the National Acme Co. embodies many features calculated to facilitate production. The main building, shown in Fig. 4, is a 1-story struc-

FIG. 5—LARGE STEEL BINS IN WHICH AUTOMATIC MACHINE PRODUCTS ARE STORED

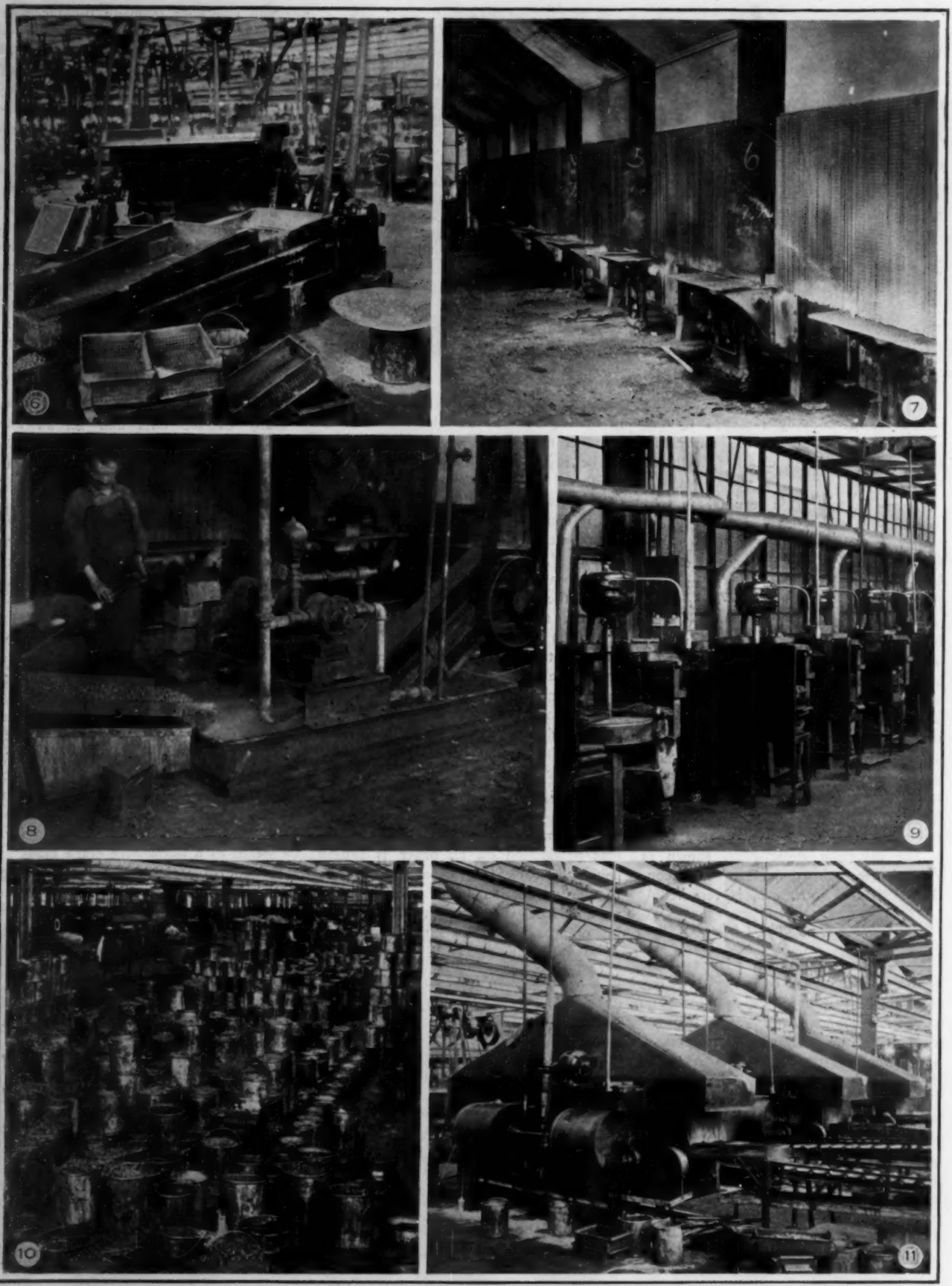


FIG. 6—A POWER SIFTER WHICH SEPARATES SCRAP FROM FINISHED PRODUCTS. FIG. 7—A BATTERY OF CASE-HARDENING FURNACES. FIG. 8—A SPECIALLY DESIGNED DEVICE FOR QUENCHING NUTS. FIG. 9—A ROLL OF HORIZONTAL GRINDERS IN THE POLISHING DEPARTMENT.—FIG. 10—MACHINE PRODUCTS AND TURNINGS AND BORINGS COME FROM THE AUTOMATIC DEPARTMENTS IN PAILS. FIG. 11—WASHING MACHINES IN WHICH FINISHED PIECES RECEIVE A STEAM BATH AND ARE CLEANED BY MEANS OF A SODA-ALKALI SOLUTION

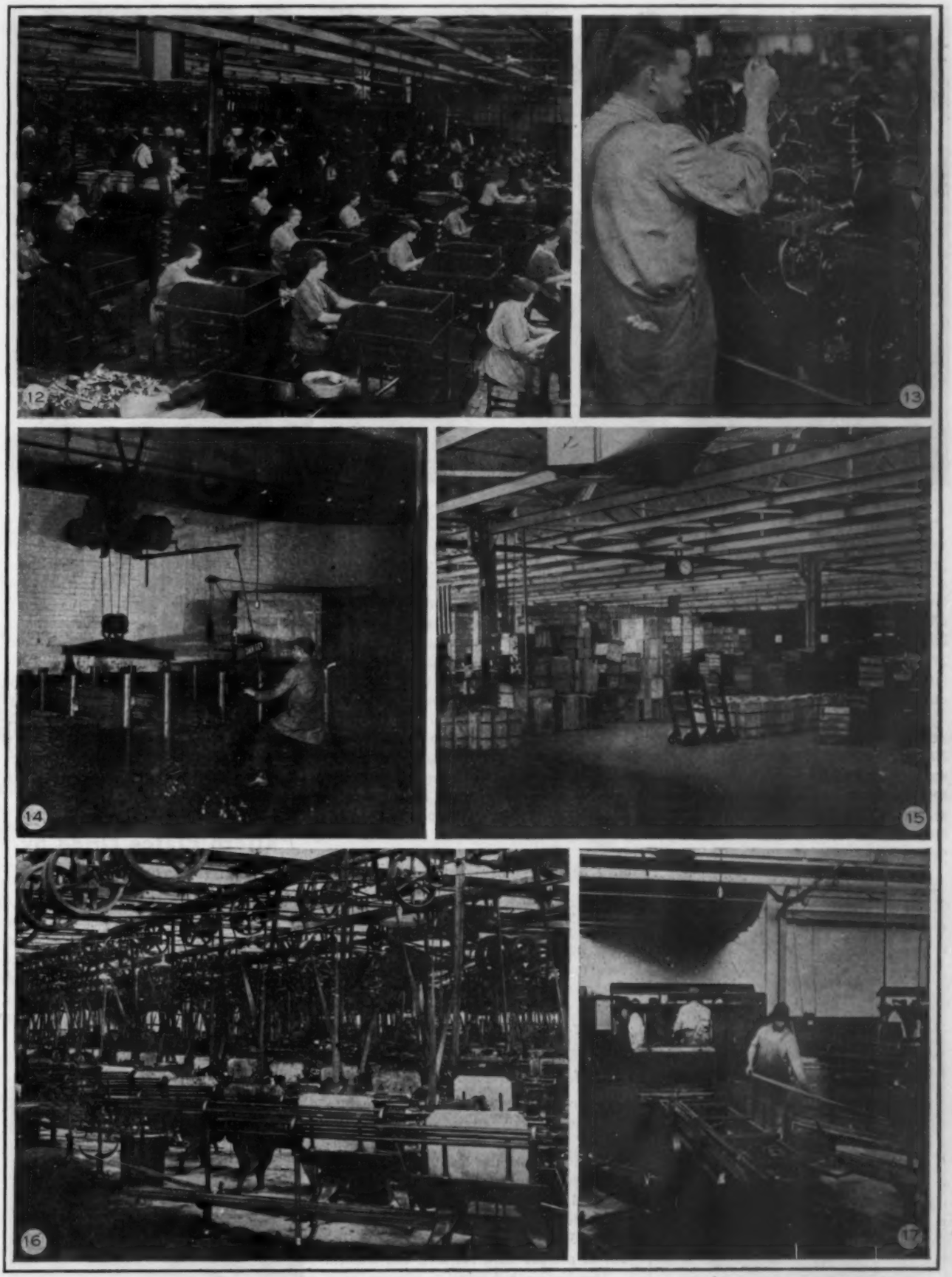


FIG. 12—A VIEW IN THE ASSORTING ROOM. FIG. 13—THE CHIEF TASK OF THE LINEMAN IS TO SET UP MACHINES FOR SPECIAL JOBS. FIG. 14—HOW BAR STOCK IS HANDLED IN THE WAREHOUSE. NOTICE THAT A SPECIAL SLING IS PROVIDED FOR HANDLING BARS. FIG. 15—A VIEW IN THE SHIPPING DEPARTMENT. FIG. 16—AUTOMATIC MACHINES ARE SET AT AN ANGLE WITH THE COUNTERSHAFT. FIG. 17—BAR STOCK IS BROUGHT TO THE MACHINES ON TRAILERS DRAWN BY ELECTRIC TRACTORS

FIG. 18—A VIEW OF ONE OF THE WASHROOMS IN THE COIT PLANT OF THE NATIONAL ACME CO.

ture with sawtooth roof covering approximately 7½ acres. This type of construction, which permits the use of large areas of continuous sash above all working floors, affords good daylight illumination. Artificial lighting is provided for by high-powered electric lamps spaced at intervals of 25 feet and located 11 feet above the floor.

An unusually effective heating and ventilating system has been installed. Each of the four units consists of a supply fan, heater, air washer and return fan, vacuum pumps and circulating pumps. The air washers of the two larger units have a capacity of 90,000 cubic feet of air per minute. The air entering the washers may come from outside the plant, or if desired, returned air may be re-employed by opening louvre dampers which control the volume of air to be recirculated. The washed air enters the heater, where it is heated by means of live steam reduced to 5 pounds pressure and exhaust steam from pumps and engines. The condensation from the heaters is collected in four heavy-duty traps and discharged by means of a vacuum pump into feed water heaters in the boiler room. The washed and heated air is distributed in the plant through supply ducts suspended above the lower chord of the trusses. The supply and return fans may be driven by motor or steam engine.

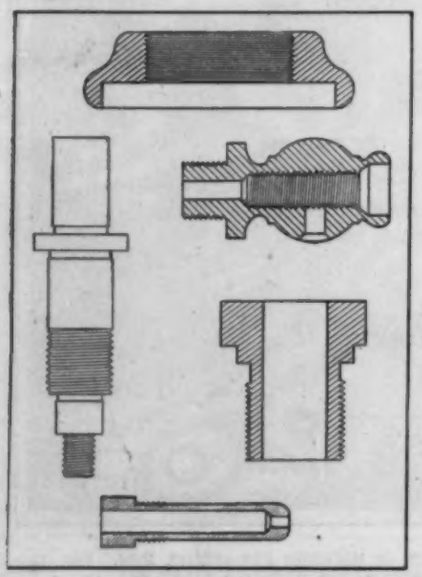


FIG. 19—CROSS SECTIONS OF CHARACTERISTIC AUTOMATIC PRODUCTS

Fig. 18 shows one of the wash rooms of the plant. The floor throughout the main building is of woodblock. In each department where oil is used extensively, sawdust is thrown on the floor in the morning and swept up in the evening. The sawdust, with its accumulation of oil, is burned.

Cafeteria Serves 1500 *Employes*

Among the features recently added to the plant is a cafeteria system, consisting of several serving units in convenient parts of the building and a central kitchen in which food is prepared for all units. The cafeteria is well equipped and amply fulfills the needs of the 1500 employes. Separate dining rooms are provided for men and women.

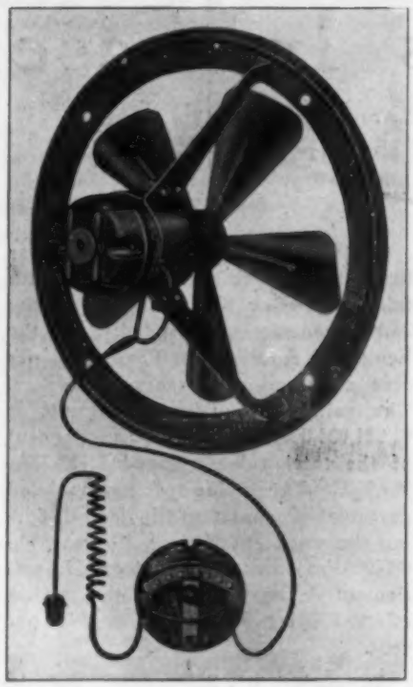
The National Acme Co. also operates a large plant on Stanton avenue, in which automatic machines, threading dies and taps are manufactured. Prior to the time the Coit plant was completed, the manufacture of machines and machine products was carried on in the old plant. Building operations on the Coit plant were commenced in the fall of 1917 and during the war a portion of its capacity was devoted to the production of parts for Liberty motors. The officers of the company are A. W. Henn, president; E. C. Henn, vice president and general superintendent; and N. S. Rathburn, secretary and treasurer. W. R. Mitchell is works manager of the Coit plant.

Pattern Plates Dried by Electrical Heaters

Moisture, which collects on the surface of cold-metal patterns, comes from the damp sand and from the atmosphere on humid days. When a pattern is wet the sand of the mold adheres to it causing small holes on the surface of the mold which then produces a rough casting.

The collection of moisture can be

HEATING METAL PATTERNS ELECTRICALLY



VENTILATING FAN, SPEED CONTROLLER AND FLEXIBLE CORD

prevented by heating the pattern. The heat applied, however, must not be so great as to cause the sand in the mold to dry, as it would then crumble away and again the casting would have a rough surface. Furthermore, the heat must be applied in such a way that the pattern can be conveniently changed when desired.

The usual method of heating is by means of a gas flame left burning in the space underneath the pattern within the frame work of the molding machine. It is difficult to keep the flame low enough so that it will not heat the pattern too much. A larger flame than necessary is, therefore, employed at some distance from the surface of application. This makes an inefficient arrangement, as most of the heat is dissipated into the surrounding space. Some trouble is also experienced in keeping the flame properly regulated.

In order to obtain a more efficient and convenient method for heating molds the Westinghouse Electric & Mfg. Co. manufacture electric heaters, one style of which is shown in the accompanying illustration. Two steel-clad heaters are shown mounted in the space immediately below the metal pattern plate, within the frame-work of the molding machine. In order to use as little heat as possible, they are located just below the thickest pattern used. They are attached to supporting angles connected to the frame of the machine. It is obvious then, that any pattern of any thickness and of any size within the capacity of the machine, may be attached to or removed from the molding machine without being interfered with by the heaters, and without disturbing the heaters.

An asbestos insulating plate is inserted just below the heater to prevent undue loss of heat.

The heaters consist of slotted ribbon resistors insulated in mica troughs, the whole being enclosed in a heavy sheet-steel casing. The two heaters used on each machine have a total rating of 300 watts and operate on 110 volts. Connection is made to a wall recepticle convenient to the machine, by means of a flexible cord having a separable attachment plug on the end of it.

If for any reason, such as the machine standing idle, the pattern plate should become overheated, it is only necessary to pull the plug from the recepticle and leave the heater disconnected until the plate cools to the proper temperature.

Small Ventilating Fan is Easily Installed

A light fan has been designed by the Buffalo Forge Co., Buffalo, for ventilating close or fume-filled offices, chemical plants or shops. It is claimed that the 5-blade fan, which is 16 inches in diameter, can handle 1000 cubic feet of air per minute. The motor, which is totally enclosed, has a variable speed and operates on any 110 or 220-volt direct-current or single-phase alternating-current of from 25 to 60 cycles. Ball bearings are used to produce smooth and noiseless running.

The motor is supported in a pressed steel tripod which offers small resistance to the flow of air. No wiring is necessary in installing the fan, the flexible cord and plug being made to fit an ordinary light socket. A speed controller designed to give six speeds ranging from 500 to 1000 revolutions per minute is part of the fan equipment. The fan is rated as approximately 1/30 horsepower.

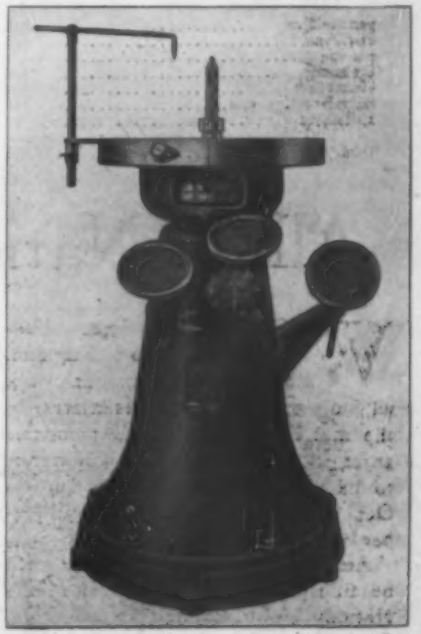
Designs New Machine for Dynamic Balancing

To insure quiet running, rotating parts should be carefully balanced. Otherwise vibration is bound to be in evidence. This applies to all revolving units that are run above normal speeds such as flywheels, gears, propellers, turbine rotors, etc. An expert workman can balance almost any running part in the engine lathe provided he is given plenty of time. However, as he is guided by rule-of-thumb only, the results are gained at a high labor cost.

To permit the balancing of rotating parts quickly, the machine shown in the accompanying illustration recently was developed by the Crawford Tool & Mfg. Co., Chicago. This machine is designed to handle rotating parts which need not be in static balance. When the machine is set in motion it indicates the amount of vibration that is present. Then, by means of tables which accompany the machine, the correct amount of metal to remove from the heavy side is readily ascertained.

The operation of the machine is comparatively simple. The operator puts the part to be balanced on the spindle and locks it securely in place. The machine is then started at low speed and if the indicator does not show a vibration exceeding 10 points the speed is increased. Then by manipulating the hand wheels at the front of the machine, the part is brought in balance. This is accomplished by throwing the spindle off center. The amount to remove from the part to bring it in balance is easily found. Thus after the heavy side has been lightened, as for instance by drilling, the part is tested again.

It is said that the machine is simple to operate and that with a little experience an ordinary operator can bring the piece to be tested into dynamic balance within eight seconds. A chart accompanying the machine gives the number and depth of holes to drill to remove various amounts of metal in balancing.



SELF-CONTAINED BALANCING MACHINE

Government's Stocks Increase

Liquidation of Contracts Progressing so Rapidly That War Department's Iron and Steel Tonnage Advances From 577,021 to 643,515 in Month — 87 Per Cent of Contracts Now Settled

WASHINGTON, Sept. 23.—Liquidation of contracts by the war department has progressed so rapidly that the stocks of iron and steel it had on hand Sept. 9, 643,513 tons, practically all of which were held by the ordnance department, exceeded by approximately 65,000 the quantities on hand Aug. 9, when the total was 577,021 tons. Figures showing the tonnage on hand on the former date are presented in an inventory completed last week by the raw materials and scrap section of the war department.

Of the stock on hand, 335,999 tons was listed as scrap. This included such items as 174,123 tons of shell forgings, as compared with 224,219 tons of similar material on hand Aug. 9. The increase in stocks on hand is reflected chiefly in adapter and booster assemblies, scheduled as scrap, of which there was 86,771 tons, as compared with only a light tonnage on Aug. 9. Billets showed a decrease from 110,382 tons to 93,186 tons, and ingots from 46,270 tons to 35,572 tons. Nonferrous metal on hand totaled about 110,000 tons.

The itemized schedule of tonnage held by the ordnance department, representing virtually the entire total, follows:

Raw Materials:	Tons
Ferromanganese	37
Ferrosilicon	162
Pig iron	4,985
Spiegeleisen	476
Zirconium ore	740
Manganese ore, ground	120
Miscellaneous	24
Total	6,544

Semifinished	
Billets	93,186
Ingots	35,572
Nickel steel ingots	3,731
Total	132,489
Finished	
Band iron	23
Bar iron	42
Flat iron	52
Galvanized iron	37
Sheet iron	72
Structural iron and steel	624
Armor plate	1,800
Miscellaneous sheets and plates	75,932
Flange steel	2,088
Rails	1,065
Cold-rolled rods and sheets	16,975
Hot-rolled rods and sheets	1,721
Drill rods	237
Welding rods	69
Shell rods	37,354
Adapter steel	1,095
Annealed steel	1,011
Beveled steel	11
Coil steel	113
Copper-clad steel	5
Decarbonized steel	36
Galvanized steel	162
Gun steel	1,817
Hexagonal steel	982
Machine steel	223
Reinforcing steel	503
Screw stock	10,277
Special steel	588
Spring steel	93
Strip steel	1,431
Tool steel, carbon	2,744
Tool steel, high speed	233
Miscellaneous tool steel	827
Tin plate	1,886
Terne plate	586
Bars	93
Miscellaneous	400
Square bars, 2½ inch	30
Plates and angles	177
Strap iron	8
Tubing	538
Pipe and tube	600
Total	164,560
Alloys	
Manganese steel	105
Chrome steel	78
Chrome nickel steel	71
Nickel steel	3,179
Nickel steel plates	79
Chrome vanadium steel	511
Total	4,023
Scrap, total	335,999
Aluminum	70
Brass	108,311
Bronze	267
Copper	363
Lead	1,013
Zinc	10,887

Contracts reported on Aug. 30 as liquidated by the war department totaled 22,030, or 87.4 per cent of the 25,196 contracts suspended. Of the liquidated contracts 10,022 or 45.5 per cent relate to purchase and storage. The value of liquidated contracts is $1,981,005,000, which is 52.5 per cent of the total value suspended, $3,774,964,000. The value of uncompleted portions of contracts liquidated during the week ended Aug. 30 was $40,670,000, payment to contractors in settlement being $6,433,000, the saving effected being $34,237,000, or 84.2 per cent.

An outlay of $251,000,000 will be required to secure relinquishment of the $1,794,000,000 of suspended contracts still unliquidated, assuming that future liquidation in each bureau can be effected at the same rate of cost as has obtained in the past. The bureaus having the largest values of unliquidated contracts are: Ordnance, $1,390,000,000; air service, $250,000,000, and purchase and storage, $134,000,000.

Tractors and heavy artillery constituted a large part of the August production. The important items include 95 175-millimeter recuperators; nine 155-millimeter gun forgings; 13 155-millimeter guns; nine 240-millimeter howitzer forgings; 27 240-millimeter howitzer machinings; 18 240 millimeter howitzer recuperators; 18 240-millimeter howitzer carriages; 20 12-inch railroad car mortars; 600 Browning tank guns; 92 10-ton artillery tractors, and 53 20-ton artillery tractors.

Allied Nations in Trade Conference

WASHINGTON, Sept. 23.—Delegates from England, France, Belgium and Italy will be present as representatives of the metal industries of their countries at the international trade conference to be held at Atlantic City, Sept. 30-Oct. 3, at the invitation of the Chamber of Commerce of the United States.

Among the British delegates will be Baillie John King, chairman of the National Light Castings association. French delegates will include M. Paul Schneider, president of the French mission and of the Creusot Works; M. Pousset, M. Peson and M. Dion, engineers, the first named being assistant to M. Schneider. The French delegates will represent chiefly the steel industry. Among the Belgian delegation will be Albert Never, engineer and manufacturer, and Louis Canon-Legrande, president, permanent committee of the international congress of chambers of commerce; president of the Federation of Commercial and Industrial associations of Belgium, and president of the Chamber of Commerce of Mons. The Italian delegation will include Commander Pio Perrone, of G. Ansaldo & Co., representing the shipyards and metal manufacturers of Italy.

Under the heading of major topics at the conference is scheduled economic readjustment of commercial and industrial conditions in England, France, Italy and Belgium. It is deemed essential that a frank state-

ment be made as to what is needed to place these countries on a basis of stable and enlarged production. This may involve an inventory of available supplies and resources, with the view of arriving at an estimate to serve as a guide to American business men, manufacturers, producers, bankers, etc., in planning their trade relations in the future.

Foreign exchange and all the forms in which questions of credits may arise will be discussed. England recently announced a plan for credits up to three years in connection with sale of British goods to unsettled parts of the Near East. Italy may have special needs for capital for rehabilitation and expansion of its industries and may find value in an opportunity to describe the relation of its proposed taxation on capital to new investments. Even the German mark and its exchange value may be considered.

"It is recognized that wars have been due to trade rivalry," says the national chamber's announcement. "Perhaps it has not been sufficiently noticed that the commercial hostility which leads to armed conflict may probably be a cumulative effect of innumerable irritations of unfairness and discrimination, having an influence in official circles which are in communication and sympathy with the commercial class. These practices are all manifestations of a spirit of hostility which might possible be lessened by discussion. A general consideration of unfair competition in foreign trade to see how far the principles of fairness, which have been applied in legislative and administrative regulation to domestic trade, might be applied to international trade."

There will be an American committee for every subject, including producers, shippers and economists who will meet from day to day with the foreign delegates. By this method of procedure every foreign delegation will have opportunity to state the needs of his country to the appropriate committee.

Government to Complete By-Product Ovens

Washington, Sept. 23.—Expenditures to the extent of $15,000,000 are being made by the war department for the construction of by-product coke ovens, witnesses told the house committee on war expenditures last Friday. The building of the ovens had progressed to such a point by the time the armistice was signed that it was held to be impractical to cancel the contracts under which they are being erected. Witnesses included Col. J. H. Burns, former Capt. George R. Roe, of the ordnance bureau, and Russell S. McBride, of the bureau of standards. It was stated that the supply of toluol exceeded the army's needs.

The contracts involved four plants, including those of the Donner Union Coke Co., Buffalo; the Domestic Coke Corp., Fairmount, W. Va.; the Birmingham Coal & By-Products Co., Birmingham, Ala., and the International Coal Products Co., Clinchfield, Va. The contracts for the first three plants were given to the Koppers Co., and involve an expenditure of $13,000,000. The expert adviser of the bureau of ordnance for the building of the plants was C. J. Ramsberg, who is associated with the Koppers Co.

Captain Roe, the engineer in charge, said that the government, which is advancing the money to build the ovens, has the right to take any part of their product, with the condition that, when completed, the prospective owners will take them off the government's hand at an appraisal which may be as high as 85 or 90 per cent of the cost.

The contract for the plant at Clinchfield went to Ford, Bacon & Davis, engineers, the government advancing $2,000,000 to the owners, which is to be repaid in full in four annual installments with 5 per cent interest.

Submit Plan For Disposal of Merchant Fleet

Washington, Sept. 22.—A plan for the gradual disposition of merchant vessels will be urged upon congress by the National Merchant Marine association if recommendations of the executive committee of the association are adopted.

The committee is convinced that ultimate private ownership and operation are essential to the upbuilding of a merchant marine but at the same time its investigations have brought it to the conclusion that an immediate sale of all the ships is not only undesirable but impractical.

The committee recommends that the government sell its steel vessels of desirable types to American individuals or firms as the demand from responsible purchasers develops. The smaller vessels, the committee thinks, should be sold at once, without restriction as to purchasers.

Pending the development of a market for the government ships, the committee recommends that the vessels be chartered to private concerns. Such government vessels as are operated by the government the committee feels should be used to develop new trade routes and should not be used to compete with privately operated lines where those lines are giving adequate service.

Freight Rates to Uruguay and Argentina Reduced

Washington, Sept. 23.—Reductions ranging from $2 to $7.50 a gross ton have been made by the shipping board in freight rates on iron and steel articles from United States Atlantic ports to ports in Uruguay and Argentine. Plain wire is included in the list. The reductions, which became effective Aug. 21, include the following:

Iron and steel articles to Montevideo, Uruguay and Buenos Aires, Argentine, from $20 to $18; barbed wire, from $22.50 to $20.

Iron and steel articles to La Plata, Argentine, from $22.50 to $20; barbed wire, from $25 to $22.50.

Iron and steel articles to Rosario and Bahia Blanca, Argentine, from $25 to $23; barbed wire, from $27.50 to $25.

Iron and steel articles to Port Madryn, Argentine, from $35 to $30; barbed wire, from $40 to $32.50.

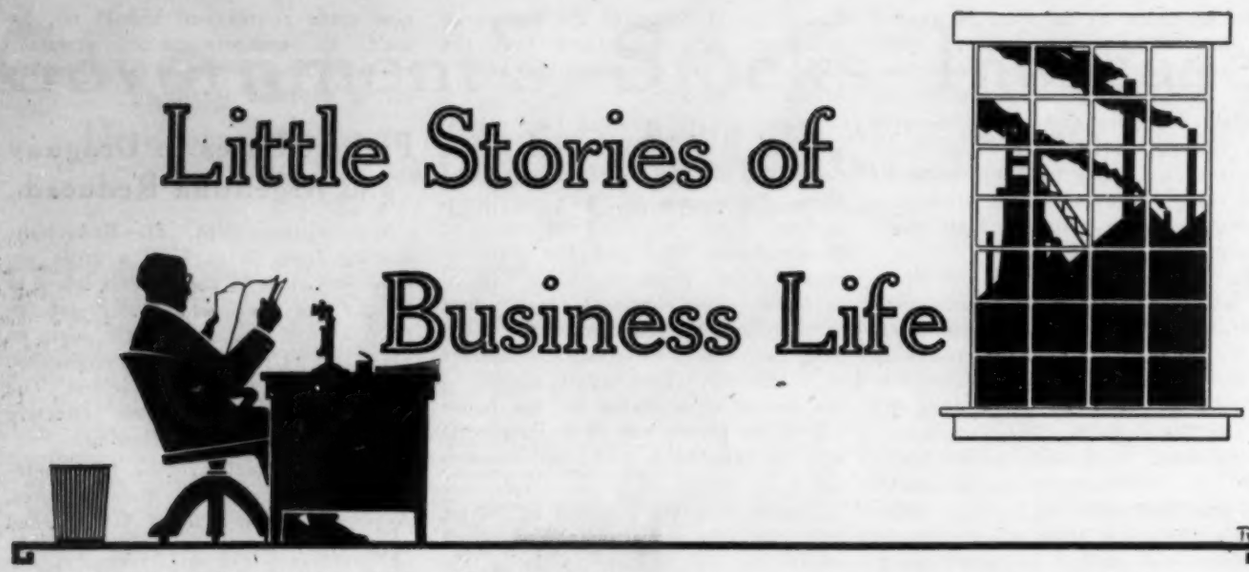
Col. Woods Makes Plea For Technical Men

Washington, Sept. 23.—More than 15,000 discharged officers and enlisted men of technical and professional training and executive ability have been in communication with Col. Arthur Woods, assistant to the secretary of war, concerning their employment in civil life, since the establishment of his office in Washington. Of this number some 10,000 have been referred to opportunities for employment in practically every line of business requiring men of special training.

"During the war, and since the armistice, so many changes have been made in the personnel of manufacturing concerns and business organizations in general, that a large number of technical men on their return find it necessary to look for new places in their professions," said Colonel Woods. "Theirs has been a difficult problem for several reasons. One is that while they have been directing their energies along new lines, their work back home has often been undergoing radical changes.

"Some have not been placed, and others are to be relieved from service. It is for such men that we are making effort to open new fields. The revival of the construction of public works has helped much, but this source cannot be expected to assume the full burden, and we must look to the business world for opportunities. We hope that they will be offered to us."

Little Stories of Business Life



A Precious Quarter

TO write a $4,000,000 check in payment of a property which five big steel companies had tried in vain to obtain within the past two years, then be virtually held in pawn in a barber shop waiting for some one who knew him to come in and pay for his shave is an experience that befalls few of us. But it happened to Charles M. Schwab recently. Mr. Schwab went to Pittsburgh, met James J. Flannery and J. Leonard Replogle, went out to the Bridgeville vanadium works, inspected the plant and then wrote a check for $4,000,000, payable to Mr. Flannery. Later in the day Mr. Schwab stopped for a shave in the barber shop of the Dusquense club.

"Nobody I knew came in for nearly an hour," said Mr. Schwab in telling the story. "Then I saw Willis L. King, vice president of the Jones & Laughlin Steel Co., and Willis loaned me a quarter. I paid the barber and got out of 'hock.'"

Blast Furnace Twins

NOT often is it possible for two crews of blast furnace workers to compete with practically all elements exactly balanced, and to compare production figures from month to month. Such a case now exists in the Chicago district, two stacks having been built from the same plans at almost the same time by the same engineers and both under the same ownership, but located several miles apart so that absolutely separate organizations control them. One of these is at the plant of the Iroquois Iron Co., South Chicago, and the other at the plant of the Mark Mfg. Co., Mark, Ind., both subsidiaries of the Steel & Tube Co. of America. So closely do these stacks run that more than a few hundred tons difference in the monthly output never is noted. In the 31 days of August, the tonnage was about 400 tons in favor of one stack. The sport of competition between the operating forces of the two plants is keen and it serves to produce the best possible work from those responsible for results.

Preparedness

HOW the foresight of the Perrone brothers, operating the great Ansaldo Co., at Genoa, probably saved Italy from defeat at the hands of Austria is related by Frank A. Vanderlip in his new book "What Happened in Europe." When Germany began the war, and before Italy became involved, the Perrone brothers converted their plant into an ordnance establishment. They could not obtain at that time orders from either the allies or from their home government. Regardless of this fact, however, they made 2000 pieces of ordnance of the same design as the most efficient French guns.

"Then come the Ceperetto disaster," Mr. Vanderlip relates. "Not until that awful defeat did the Italian government turn to them (the Perrone brothers) with cries for guns. When the first order was placed the officials were confounded on being told that the guns were ready for immediate delivery. These 2000 guns were at once put in the field to take the place of the vast losses which the Italian army had sustained, and furnished Italy a service in stopping the advance of the Austrians the value of which can hardly be measured."

Steel Spines and Millions

FOR years metaphors have been taken from the world's great basic industry, the iron and steel business. We have heard of "the iron heel" and "the mailed fist," many times during the past five years. Ancient history refers to "the iron-clad army." Memory also brings "the iron chancellor" into prominence when Bismarck is mentioned. The Bible refers to "the pen of iron" and "the rod of iron" while Shakespeare speaks of "the steel couch of war" and wrote: "Grapple them (friends) to thy soul with hoops of steel." Modern oil stock venders, likewise make use of such similes. One Texas oil company's get-rich-quick propaganda appeals to the gambling instinct direct. The promoters are "playing a game that has made millionaires over night;" but state "it is not a game for weaklings but one for 'steel-spined speculators.'"

Averting Strike Loss

AN incident connected with the Akron, O., machinists' strike, indicates how a fair-minded operator of a machine shop in Cuyahoga Falls, O., kept his shop running full and his men at work after they had declared their intention of walking out in sympathy. One morning after the workmens' spokesman had delivered their ultimatum, the owner of the shop went out into it, called his men around him and said:

"Men, you have told me that you are going to strike in sympathy with your Akron friends and I don't blame you. Were I in your place, I should strike too. But, let's look at this proposition in the right light and do a little sane financiering. We all live

here in Cuyahoga Falls; if you strike, you'll be without work for the duration of the walk out and at the end you'll be out just so much money. I'll tell you what I'll do. You stay on and work and let the Akron men strike, if they want to. If they strike and gain their demands, whatever they are, I'll adopt them for this shop union or nonunion. If the award is made retroactive, it will be made retroactive here as well. Now, what do you say, are you going to stay on at work and keep this shop running full?"

A chorus of "sure" was the response and the shop has seen no idle moment since.

Owe Schwab a Title

SCHWAB should have been made a duke. If any man ever deserved the gratitude of England, Schwab is that man. But he has not even received the "order of the bad egg."

Thus Baron Fisher of Kilverstobne, former first lord of the British admiralty, in a recent article on the war compliments Charles M. Schwab for the service he rendered England in delivering "a batch of submarines" in record time.

"When I left the admiralty on Jan. 1, 1910, there were 61 efficient submarines and 12 were building," Baron Fisher wrote. "When I returned to the admiralty in October, 1914, there were only 51, so I sent for Mr. Schwab, of the Bethlehem Steel Works, and he delivered a batch of submarines in five months, an unprecedented feat, as 14 months was the record until then. These H type submarines built by Schwab went unconvoyed from America to the Dardanelles and acted there prodigiously."

Music Hath Charms

FEATURED at the recent convention of the National Association of Organists, in Pittsburgh, was an address by Frank E. Morton, acoustic engineer of the American Steel & Wire Co., Chicago, New York and Cleveland. It was entitled, "The Organist's Influence and Responsibility," and presented the great and pressing need of a new kind of music to be used as a stimulating force in modern industry. Mr. Morton urged the organists to realize the perils of the music famine in this vitally important field and to exert all their influence in encouraging an output of the right sort of music for use in the workshops of today. He said in part:

"For scientific agriculture the old plantation melodies are not adaptable; for the vast woolen and cotton mills of today the spinning song is out of date; the herdsman's pastoral is too feeble to combat the cacophonous chorus of a stockyard; stokers in a liner's engine room or deckhands on an oil tanker do not respond to barcarole; roller process mills fail to chime in with the rollicking ditties of the jolly miller; and the village blacksmith can sing no role in the great ensemble of an automobile factory.

"Music of today is not impotent to typify anything beyond the most primitive activities of man. Industry is not unpoetical, inartistic, unmusical because its magnitude for the moment staggers the imagination of the music purveyors so that they turn from it to paltry trifles.

"For a time science, too, lost its contact with life; perched itself on an inaccessible peak and considered it derogatory to its Godlike achievement to be of practical, human everyday assistance. But science for science's sake has had its day. Live science has become a reality, a big reality. Live music, that will do its part in turning the wheels of the world's workshops, is a possibility of the future."

Machinery by Air

THE feasibility of transporting machinery and supplies by airplane to the numerous gold and silver mines in the States of Sinaloa, Mexico, is to be investigated by the British government, according to an article in a recent issue of *Commerce Reports*. According to the story, it appears that a British company is prepared to organize and operate an air service between the mines and railway stations for the transportation of machinery and supplies to the mines, which, due to their mountainous location and the absence of roads, at present are practically isolated. At present it is practically impossible to transport heavy machinery to these mines and the only machinery which can be transported must be carried on the backs of burros, whose maximum limit of carrying is about 500 pounds each. It is understood that it would be the purpose of the proposed company, to transport machinery weighing several tons.

Eminence in Small Places

MANY articles in common use come into our hands without a thought as to their production, thus the obscure little town of Westfield, Mass., produces 90 per cent of the world's whips, and another little New England town, Alton, N. H., has the world's largest plant for the manufacture of cork screws. William R. Clough, the manager of the latter company, is the inventor of a machine which automatically turns out the completed articles. A piece of wire is fed into the machine at one end, and comes out in the form of finished cork screws at the other. These machines while in existence more than 20 years are still protected by patent interests, and although they are leased to anyone desiring to manufacture cork screws, they are never sold.

Purpose, the Stabilizer

SECRETARY LANE of the interior department, in appearing before the senate committee on education in behalf of the Americanization bill, summed up what was accepted as a comprehensive view of the reasons for the industrial unrest in this country. He said:

"The people want thought given to their concerns. They knew where they were going during the war. They were all co-operating for the destruction of the enemy. They enjoyed the definiteness and the concreteness of that objective. They could see where they were going each day. Then peace came and they lost that objective.

"Life seemed comparatively without purpose. They were thrown back upon themselves and to purely selfish concerns. We lost our national morale because we failed to keep alive the idea of Americanism as we had kept it alive in the war. We had been going forward purposefully in the great work of winning the war and we did not shift back quickly enough to the work of putting our steam into the work of giving a new motif to the American drama."

Benefic Combination

AN interesting contribution to the literature on the high cost of living comes from the department of agriculture. Incidentally, it indicates dealers apparently are making some profits which, under pressure, they are willing to forego. This is the item:

"Through efforts of the farm bureau office of Eddy county, N. M., baling ties were obtained at an actual saving of $450. The orders were pooled and placed through a local store. In addition to the above saving, prices charged by other dealers dropped from $1.75 to $1.30 a bundle."

Piez Declares for Open Shop

Former Director-General of Emergency Fleet Corp., Urges Employers Not to Yield a Particle on Principle Merely to Obtain Temporary Peace—Sees no Hope for Unions Until Leaders Who Violate Pledges are Expelled

ORGANIZED labor cannot hope to make further progress until it has purged itself of leaders who violate agreements made with employers, Charles Piez, former director-general of the Emergency Fleet corporation, told representatives of the Associated Business Papers at their annual meeting in the Congress hotel, Chicago, Sept. 18. Mr. Piez declared in favor of the open shop, and narrated the experience of the Link-Belt Co., of Chicago, of which he is president, to prove that the open-shop principle must prevail, at least until labor is ready to abide by its solemn covenants. Particular significance was attached to his reference to the open shop by reason of the attempt of organized labor in the iron and steel industry to force the issue on employers.

Mr. Piez declared the Link-Belt Co. has operated an open shop for 13 years despite frequent attempts to unionize it. It has done so, he pointed out, because on four successive occasions trade union leaders with whom it had dealings failed to keep their pledges. The employes now recognize that the company is right in refusing to deal with "the welchers" of the trade unions.

Union leaders broke their agreement in the case of the Seattle shipbuilders' strike, Mr. Piez said. The Fleet corporation was bound to certain labor policies which it did not formulate and upheld them when certain labor leaders demonstrated they could not be trusted. It demanded strict adherence to the principles to which the men had subscribed. He urged all employers to stick to principle and not yield in the slightest for the sake of maintaining peaceful relations.

The administration's labor policy, he stated, involved permission to unionize many plants which for years were nonunion, and also provided for shop committees. Labor conditions which obtained in war time have had an effect on the present, but Mr. Piez said he was not sure that shop committees will prove a solution for the labor problem, chiefly because of the delay which is necessarily encountered.

A great share of labor unrest is due to the fact that employes have a wrong understanding in regard to the profits made by employers. Foreign-language newspapers and propagandists are teaching the workers that their employers are making enormous profits, with the inevitable consequence of breeding distruct and avarice. This situation should be met squarely and employers should do all in their power to refute the statements. Mr. Piez said much depends on the training and capacity of foremen and superintendents. His experience as a manufacturer, he declared, convinced him that the only logical method for paying workmen is on a production basis.

Issue Must Be Met Squarely, Says Piez

IF there is any cloud on the horizon of American business, if there is any menace to the continued prosperity of American industry, it lies in the present day labor unrest," said Mr. Piez. "No matter where it had its origin the unrest is being capitalized today by a group which is not aiming at a mere improvement in the conditions and hours of labor, but which is aiming at the control of industry and the control of our great government as well.

"There are some 700 or 800 foreign-language publications, all of them containing poisoned articles against the fairness of the distribution of the profits of industry and against the fairness of our system of government. There are something like 2500 paid lecturers drawn from foreign-born and native intellectuals, who put up a continuous story of the wrongs of the present wage system and the present social regime. Perhaps the biggest cause of unrest, and I have met this not only in my own business repeatedly, but also in my experience with the fleet corporation, is the exaggerated notion which the men have of the profits of industry.

WE have run an absolutely nonunion shop in Chicago for 13 years, and we have done it in the face of a combined effort to unionize us. Why? The men realize that we are justified in our position because in the case of four successive agreements we had with the unions, the unions welched on each and every one of them. The men realize I won't deal with a welcher in business, and until the unions purge themselves of such leadership, a leadership that renounces a solemn covenant and is perfectly willing to breach an agreement for a temporary advantage, the Link-Belt Co. will have nothing to do with organized labor in this city.

Some six years ago we were threatened with a strike at our Indianapolis plant. We have there something like 2200 men. The superintendent called me up and asked me if I wouldn't come down and address the men. I have been in the habit of getting all our workmen together and talking to them collectively for many years, finding this to be highly effective.

hurried to Indianapolis and found when I got there that the strike was threatened not by any conditions inside of our plant but because of some grudge against another plant with which we had nothing to do, and over which we had no control. The strike involved the machinists and toolmakers, two of the very vital crafts in our industry.

"We called them together and I gave them a talk. After I got through, I asked them whether they had any questions to ask. One man who had been with us many years, a very able toolmaker, said: 'Mr. Piez, don't we earn our day's pay in two hours' work?' And I said, 'Well, now, let's examine that. How many hours a day do you work? Nine a day, don't you?' He said, 'Yes.'

"'What do you get?'

"'Sixty cents an hour.'

"'Then your proposition is that you earn $5.40 in two hours' work, for which we pay you $1.20?'

"He said, 'Yes, that is right.'

"I said, 'That means that we are making a profit of $4.20 a day out of your labor. Four dollars and twenty cents for two hours, or $2.10 per hour

profit out of your labor. That is three and one-half times your hourly rate, and if we carried this same argument through, our profit must be equal to something like three and one-half times our total pay roll.'

"I got a blackboard and went through the figures, demonstrated that if his conception of his earnings and the value of his earnings and our profits was right, the profits of the concern would have to be about three and one-half times our pay roll.

"This happened in March, soon after our annual meeting. I sent for our annual report, and then demonstrated that our profits for that particular man were less than $1 per day; the total about 25 per cent of the pay roll instead of 350 per cent. The man said he never knew our profit was so small.

"The radical preachings in the foreign press constantly emphasize the fact that between 80 and 90 per cent of the earnings of the individual go to the master as profit. In the Seattle strike the feeling was that the earnings of the owners were 90 per cent of the total earnings of the man; the company got $60, out of which it paid him $6. A very simple and quick calculation showed the absolute fallacy of that; showed that the profits computed on that conception were between four and five times the value of the annual output.

Sane-Minded Being Misled

"That statement was repeated to me at a conference held in Washington where there were 120 representatives of labor of the western coast. I am giving emphasis to it at present because I believe the fact that the sane-minded, intelligent American workmen have the idea that they are being treated unfairly, and are receiving too small a share of the profit, lies at the very bottom of the general unrest.

"I have no fear that they are going to lead the American workmen into the camp of Bolshevism, but I do fear they are going to change their perspective, because these statements are insiduously made and never refuted.

"Manufacturers shroud their business in too much secrecy. They don't talk it over with their men. I would feel like a thief if I thought that part of the earnings of our company were filched from the men by withholding from them a just part of their earnings. And on that account I am prepared at any time to discuss it with them, to be converted to their side or convert them to mine, if that is possible.

"I have thought that the best way to reach our men is to reach them through our superintendents, our foremen and subforemen. I find that most of those men are intelligent, active, alert Americans, typically good citizens, upon whose judgment we rely to create sound public opinion, and they must be the judges of the correctness of our theories and our methods, and serve as our champions.

"I find among these men there are wrong theories. Some have gotten away from the feeling that this government is a government by majority; they feel there is virtue in an organized minority, an aggressive, vociferous minority, because in certain cases the general public has bowed to the demands of just such a minority. I feel, therefore, that there is absolute need of bringing the foremen and the subforemen back to a realization of the fundamental principles of constitutional government and of business economics."

Mr. Piez then said his company operates on open-shop principles and has done so for 13 years in the face of repeated efforts to unionize it. In the case of four successive agreements his company had with the unions the unions violated them, and he declared that until the unions purge themselves of leaders who renounce their covenants his company will have nothing to do with them. Continuing he said:

"That same doctrine dominated the Emergency Fleet corporation in the Seattle strike. There, too, was an absolute breach of an agreement, solemnly signed; an agreement drawn up in the presence of the leaders of the Puget sound movement, breached three months before its expiration. Why? Because the leaders there were advised that by demonstrating their power they could win. They didn't win. Whether men are employes of the government or of private industries, if they breach an agreement they ought not to win.

"The fleet corporation took control and declined to have any conference with the men until they returned to work, and the fleet corporation resisted some very powerful political and social pressure to confer with the men. The men had had their hearing before a properly constituted board in accordance with their agreement. They were awarded less than they asked for, and they appealed to the appeal board provided in the agreement, and they lost before that. There was no opportunity for further compromise.

"Somewhere you must stop. You can't have a supersupreme court about the supreme court. That isn't democracy. We emphasized the principle there, and it was a very beneficent principle. It is a good doctrine because some employers are willing to compromise, even though a matter of principle is involved.

"The conditions under which labor should work were not developed by the fleet corporation. I accept my full share of responsibility for the things done by the corporation, but I accept no responsibility for the labor principles under which we were compelled to work. The principles involved practically permission to unionize plants that for years had been nonunion; and it involved the creation of shop committees.

"Most employers, recognizing that the administration had declared in favor of these principles, went wholeheartedly to work to carry them out as best they could, but I remember a case on the west coast in which the shipbuilder appointed a shop committee of three, which consisted of two sons and one nephew. That was hardly in the spirit of the agreement, and it came very near upsetting the entire industry in that district.

"I am not prepared to say that the shop committee is an entire solution of the difficulties that are likely to arise. Some one has said that perhaps it was a good thing the ten commandments were handed down direct, and did not come through a committee, because they might not have arrived yet.

Favors Reasonable Partnership

"I want partnership with our men, but recognize there are many ways of securing it. Partnership must be based on fairness and must involve acceptance of risk, as well as participation in profit. It must, therefore, be confined, in many cases in industry, to the immediate work which is under the control of the partner, and he must not be held responsible for the failure or success of policies or theories with which he had nothing to do. You can't make a partner of the man who is not responsible for the risk the partnership involves, and you can't expect a workman to sacrifice part of his income in such a partnership. You must confine his interest to the work under his control and give him part of the profits which extra effort or intelligence on his part bring about.

"My company has been paying on a production basis for many years and we have had no labor troubles. We try to keep step with the conditions, but we always adhere to the policy of paying on the basis of production. It is the only fair way; it is the way every man in business, from the top down, ought to be paid.

By-Product Plant

To be Built by Nova Scotia Steel Company—New Furnace Planned

Toronto, Ont., Sept. 22.—It is announced that the Nova Scotia Steel & Coal Co. will in the near future erect a by-product coke plant at its Sydney mines to cost over $2,000,000. This will necessitate a further enlargement of the present plant and the construction of an additional blast furnace, which will cost about $1,500,000.

The International Bushings Co., Ltd., has been incorporated, with head office in Toronto, and a capitalization of $25,000,000, to manufacture metals from ore to finished products.

It is understood the company will be largely a holding company, associated with the Pressed Metals Co., and will take over the latter's patent rights on bushings. It will control the output of bushings manufactured under these patents, and it plans for a large business with England, France and Germany. It is being financed in Toronto.

The company is making preparations to erect a plant in Port Huron to take care of large American contracts.

A conference was recently held between the directors of the Lake Huron Steel Corp. and the municipal officials of Goderich, Ont., as a result of which it is announced that the corporation will adhere to its original decision to establish its plant at Goderich. It receives a free site of 250 acres, and has asked for freedom from city taxes for 10 years. The company will use 14,000 horsepower of electrical energy at the outset and this may be increased to 20,000. It is estimated that 1500 men will be employed in construction, and that the maximum number of employes when the plant is working at full capacity will be 4000.

The employes of the Dominion Steel Corp., in Sydney, N. S., have petitioned the Canadian government to appoint a royal commission to inquire into the suspension of operations at the plant. The petition also asks the government to inquire into the profits made during the last five years and the amount of bona fide capital invested. It declares that no satisfaction can be obtained from the management as to when operations will be resumed, and that in view of the hardship to employes and the business interests of Sydney there is a necessity for immediate action by the government.

Steel companies in western Canada have amalgamated under the name of the Canadian Western Steel Corp., Ltd. The company will have in operation at an early date three rolling mills, located at Collingwood, Ont., Medicine Hat and Redcliffe, Alberta. A bolt and nut plant will also be established at Medicine Hat, and open-hearth furnaces will be built in Collingwood.

The Gurney Foundry Co. is about to increase its capital from $750,000 to $2,000,000 and a new issue of stock will be made.

Toolbuilders to Meet

On Oct. 15 and 16 the National Machine Tool Builders' association will hold its eighteenth annual convention at the Hotel Astor, New York City. The program is in course of preparation and soon will be mailed to the membership. Worcester, Mass., is the headquarters of the association this year, since President Albert E. Newton is vice president and general manager of the Reed-Prentice Co., that city, and association general manager is Charles E. Hildreth, president and general manager of the Whitcomb-Blaisdell Machine Tool Co., also of Worcester.

Will Hold Last Hearing

The National Screw Thread commission has returned from Europe where it held a number of conferences in England and France on the subject of international screw thread standards. The results of the conferences and other efforts of the commission, are requests from Great Britain and from France for further Anglo-American and Franco-American conferences for the purpose of arriving at an international standard for screw threads.

The last public hearing in America on national screw thread standards will occur on Monday, Oct. 6, at 10 a. m., in the Engineering Societies building, 29 West Thirty-ninth street, New York. The engineering bodies interested and the industries manufacturing and using screws will meet and give full and final consideration to the report.

The National Screw Thread commission was represented at the European conferences by the following: E. C. Peck, chairman, United States army; F. O. Wells, vice chairman, and L. D. Burlingame, American Society of Mechanical Engineers; E. Buckingham, H. L. Horning, Society of Automotive Engineers; J. O. Johnson, United States army; L. B. McBride, United States navy; H. C. Dickinson, United States department of commerce; and H. W. Bearce, United States bureau of standards, and Robert Lacy, United States army, technical secretaries.

Ore Tax Bill

Vetoed by Governor of Minnesota—Effort to Pass it Second Time Fails

St. Paul, Minn., Sept. 22.—The tonnage tax bill, introduced by Senator C. M. Bendixen, of Morgan, Minn., at the present special season of the legislature, was passed by a large majority in both houses and then vetoed by Governor Burnquist. It provides for a levy on the value of ores, to be collected from individuals, partnerships and corporations engaged in the production of ore. The tax would be placed only on the profits, and concerns operating on a bare margin would be exempt. The bill was introduced with the argument that the land from which the ore is being taken is constantly decreasing in value and in time will be practically worthless, while farming lands become more valuable.

The proposal brought a storm of protest from the mining sections of the state and large delegations called upon the legislators in an effort to defeat it. Hundreds of telegrams were sent by citizens who declared the levy would cripple the range towns and drive thousands of workmen and their families to other fields. The governor in defending his veto declared that the ore land already is assessed 50 per cent higher than farm lands, and that while the land is decreasing in value the ore is continually being made into taxable objects. The executive maintained that if the profits in one enterprise are to be taxed profits in all industries also should be taxed. He stated that one of the fundamental principles of taxation lies in equality and that taxation should not be used as an instrument to impose unfair and excessive burdens on any particular class, industry or section.

Proponents of the measure profess to see in the governor's veto a victory for the nonpartisans and socialists whom, it is contended, have been furnished an argument in favor of their own principles of taxation. Members in both houses were bitter over the governor's action and a move was started to extend the session in an attempt to pass the bill over the veto. This effort was defeated.

Group insurance for its 600 employes, for amounts varying from $750 to $3000, depending upon length of service, has been contracted for by the Pittsburgh Iron & Steel Foundries Co., Pittsburgh. With each year's service with the company, $100 is added to the amount of insurance.

Obituaries

THEODORE O. VILTER, president of the Vilter Mfg. Co., Milwaukee, died Sept. 18 at his summer home in Pine Lake, Wis., aged 62 years. He had been in failing health for several months. He was chairman of the general committee in charge of the meeting of the American Foundrymen's association at Milwaukee in 1918, and had served as president of the Milwaukee Metal Trades association and also of a Wisconsin association of ice machinery manufacturers. He was born Oct. 25, 1857, at Oldenburg, Germany, coming to America while a schoolboy. At 17 he began to earn his living as a blacksmith's helper, later serving an apprenticeship as a machinist and became foreman of the shop. He was able a few years later to buy an interest in the company, known as the Weisel & Vilter Mfg. Co. In 1887 Mr. Vilter and his brothers bought out Mr. Weisel, enlarging the business, and changed the name to the Vilter Mfg. Co. He was a director of he National Foundrymen's association and the National Metal Trades association in addition to his Milwaukee connections.

Charles Mathias Jacobs, widely known English engineer and the designer of the McAdoo and Pennsylvania railroad tunnels under the Hudson river at New York, is dead at his home in London. He was 69 years old.

John McCaffrey, aged 73 years, died Monday at his home in Philadelphia. He formerly was vice president of the McCaffrey File Co., of that city of which his brother Hugh is head. Of late years he dealt in horseshoers' supplies.

Oliver Harold Lane, South American representative of the Hopedale Mfg. Co., Milford, Mass., for the past two years, died recently in Buenos Aires, aged 50 years. When 18 he went to work for the Draper Co. and for many years was private secretary to the late Gen. William F. Draper.

Otto A. Ruemelin, second vice president and works manager of Pawling & Harnischfeger Co., Milwaukee, manufacturer of cranes, hoists, monorail systems, etc., died in that city Sept. 1. His association with the Pawling & Harnischfeger Co., extended over a period of 30 years, beginning as an aprentice. After several years as a journeyman machinist, Mr. Ruemelin was promoted successively to the foremanship of various departments. Later he became assistant superintendent and then superintendent. In 1912, he was made works manager, and later was elected second vice president.

A. L. Dunning, Ravenna, O., who was believed to be the first American manager of a bessemer steel plant, died recently in that city. He took charge of the Cleveland Mill Co., Newburg, in 1867 after it had been shut down because of inability to agree with the two Englishmen who had been running it.

THEODORE O. VILTER

Col. William W. Castle, former appraiser of machinery at the Boston custom house, died Sept. 15 at his home in Weymouth, Mass., aged 76 years. He was born in Cleveland, Sept. 21, 1843, the son of the president and principal owner of the Cuyahoga Works. He came to New England in 1872 and bought the Belfast Foundry & Machine Co., Belfast, Me., which was destroyed by fire in 1873.

James Robert Fletcher, factory manager of the P. & F. Corbin division of the American Hardware Corp., New Britain, Conn., died while undergoing an operation at his home in that city, Sept. 14, aged 52 years. He had been connected with the division 12 years, coming from the Yale & Towne Mfg. Co., Stamford, Conn., as assistant to the superintendent. On the resignation of William T. Hartman, he became superintendent, afterwards being promoted to be factory manager. He was a member of the American Society of Mechanical Engineers.

John Richard Kidston Law, chairman of William Jacks & Co., Ltd., 19 Saint Vincent place, Glasgow, Scotland, iron and steel merchants, aged 62 died Aug. 29, following a slight hemorrhage of the brain, suffered three weeks previously. Early in life, Mr. Law was a tea planter in Ceylon but in 1890, he became associated in business with the late William Jacks and his brother, Bonar Law, and upon the death of Mr. Jacks, Mr. Law became senior partner, Bonar Law having retired some time before. His chief interest was in scientific subjects of which he possessed a wide and accurate knowledge. He also was an inventor and a mechanical tea roller which he produced now is used widely in Ceylon and India. At the time of his seizure he was engaged on the invention of a new type of engine.

W. Cromwell Gurney, aged 46, president and general manager of the Gurney Foundry Co., Toronto, Ont., was overcome by an attack of heart trouble Sept. 17, and died within a few minutes. He was prominent in business circles and was the eldest son of the late Edward Gurney, founder of the Gurney Foundry Co. Since the death of his father he has managed the company. Mr. Gurney was born and educated in Toronto, and had been connected with the Gurney Foundry Co. since the time he entered upon commercial activities.

Sheet Wage Unchanged

The present rate of wages paid for rolling sheets will be continued for the next two months as a result of the bimonthly settlement made in Youngstown, O., Sept. 11, at a conference between James H. Nutt, secretary of the millowners' association, and representatives of the Amalgamated Association of Iron, Steel and Tin Workers. This settlement follows the lines of the settlement with the puddlers announced Aug. 28 at which time the rate was unchanged, being based on a 2.50c bar iron card in force the previous 60 days.

Many File Views In Basing Case

Producers and Consumers of Steel Present Variety of Arguments on Question of Single Price Base—South Presents Claims for Birmingham Base—Say Change Would Favor Steel Corporation

NUMEROUS written arguments both favorable and opposed to the Pittsburgh basing point on iron and steel prices which have been filed with the federal trade commission by producers and consumers in all parts of the country testify to the far-reaching importance that is attached to this question by industry in general. The names of those companies which had filed declarations in this matter were published in the Sept. 11 issue of THE IRON TRADE REVIEW. These documents and communications have advanced many interesting and original points bearing upon the general subject. Consumers of steel in the south especially have been active in bringing their viewpoint to the attention of the commission, and in furtherance of their claims of Birmingham as a proper basing point.

An important aspect of the question has been raised through the statements presented by independent steel producers who do not have mills in the Chicago district. One of the most prominent and comprehensive of these is that filed by the Bethlehem Steel Co., which is published in large part below, together with the statements of record made by various other producers and consumers of steel.

Says Chicago Prices Depend On Pittsburgh

BY E. G. GRACE, PRESIDENT,
Bethlehem Steel Co.

THE question presented by the petition herein affects the following three classes of manufacturers of iron and steel:

(a) Those whose only mills are in the Chicago district, such as Inland Steel Co., Interstate Iron & Steel Co. and Steel & Tube Company of America which are named as respondents in the petition;

(b) Those whose only mills are in the Pittsburgh district or in other districts east of the Chicago district, such as Jones & Laughlin Steel Co., Bethlehem Steel Co., Cambria Steel Co., Lackawanna Steel Co. and Republic Iron & Steel Co.; and

(c) Those which have mills in both the Pittsburgh district and the Chicago district or which have subsidiaries that have mills in the Pittsburgh district and other subsidiaries that have mills in the Chicago district. United States Steel Corp. seems to be the only company coming within this class.

This statement is prepared from the point of view of the manufacturers of class *(b)*, that is, those who do not have mills in the Chicago district.

I. The use of the so-called "Pittsburgh base" is simply a convenient method of quoting prices and the abolishing of that base or the establishing of other bases would not affect prices but would cause confusion and inconvenience in the steel industry.

There seems to be a great deal of confusion of thought with the petitioner herein about the purpose and effect of the use of the so-called "Pittsburgh base" in connection with the prices of steel and iron. As a matter of fact the use of the Pittsburgh base has nothing whatever to do with, and has no influence upon, the prices which manufacturers of steel charge for their products. It is simply a convenient method of quoting prices—convenient to both the manufacturer and the purchaser. Its use in no way affects the freedom of each manufacturer to make any price he chooses in any territory.

In using the Pittsburgh base in quoting prices the manufacturer simply states to a prospective customer in a given territory in effect that the price of the product offered is so many dollars per ton plus an amount equal to the freight between Pittsburgh and the point of delivery. The use of this base gives precisely the same result to customers as if each manufacturer were to quote prices f.o.b. the point of delivery or f.o.b. mill, because in any case the ultimate price would be computed on the basis of the price at the mill plus freight to the point of delivery. The objection to quoting prices f.o.b. the point of delivery is that manufacturers would have to make extended computations based on varying freight rates. The objection to quoting prices f.o.b. mill is that similar computations would have to be made by the customers before they would be able to compare quotations. With the use of the Pittsburgh base, however, manufacturers can readily make quotations, and customers can compare with equal ease the quotations of different manufacturers, since the freight from Pittsburgh to a given point is the same for each customer.

Manifestly, if a manufacturer in the Pittsburgh district wishes to make a low price for delivery in the Chicago district in order to take the business from the mills in that district, all he has to do is to make a low price f.o.b. Pittsburgh. His freedom to make a low price is just as great when the price consists of a price at Pittsburgh and the freight to the point of delivery has to be added as when it consists of a price at the point of delivery in which the freight is included although not shown as a separate item.

If the use of the Pittsburgh base in quoting prices were abolished, prices paid by the customers would, upon the last analysis, be made up in just the same manner as before; that is, in every case they would include two elements—the price which the manufacturer fixes for his product at his mill and the freight to the point of delivery.

The charge that the use of the Pittsburgh base in quoting prices is the result of a combination or understanding between steel manufacturers hardly calls for serious consideration. Bethlehem Steel Co. does not have any agreement or understanding amounting to an agreement with any one or more of the respondents named in the petition herein, or with any other producer of steel, for or covering discriminations in price between purchasers of rolled steel in the Pittsburgh district or elsewhere or for the maintenance of prices of rolled steel in and throughout the Chicago district to members of the petitioner herein or to other consumers in such district; nor does it believe that any such agreement or understanding between said respondents, or any of them, or between any of them and any other producer or producers of steel exists.

The Pittsburgh base has been used in quoting prices almost from the beginning of the steel trade in this country and is thoroughly understood by both manufacturers and purchasers. It is a matter of common knowledge that the custom of quoting prices f.o.b. Pittsburgh was established more than half a century ago when practically all the steel of the country was manufactured at Pittsburgh. It has been continued to the present time by force of habit and custom as well as because of its convenience to all concerned, notwithstanding the development of new centers for the manufacture of steel at Chicago and elsewhere. It fits present conditions because in normal times the Pittsburgh district is still the largest producer of iron and steel in the country.

It is, therefore, submitted that to forbid the use of the Pittsburgh base in quoting prices for steel and iron prod-

ucts would result merely in great inconvenience to the steel trade, not only to manufacturers but to purchasers, and would benefit no one.

II. The real question raised by the petition is whether it is unlawful for a manufacturer who has mills in both the Chicago district and the Pittsburgh district to sell the products of his Chicago mills in the Chicago district at prices higher than those at which he sells the products of his Pittsburgh mills in the Pittsburgh district, although the cost of the products in both districts is the same.

As we understand the petition and the matters complained of, the real question raised is not the propriety of using the Pittsburgh base in quoting prices for rolled steel products, but is found in the charge that the respondents discriminate in the price of such products in favor of competitors of members of the petitioner herein who are located in the Pittsburgh district or the territory east of the Chicago district and against such members and other consumers of rolled steel products located in the Chicago district, in violation of Section 2 of the Clayton act, it being asserted that the effect of such discrimination may be substantially to lessen competition or tend to create a monopoly in the particular line of commerce. We do not believe that respondents Inland Steel Co., Interstate Iron & Steel Co. and Steel & Tube Company of America, which have mills only in the Chicago district, quote different prices to different purchasers within any given district which come within the prohibition of such Section 2, although such prices may be the cost of the production of the product plus freight from Pittsburgh to the point of destination. If this be so, then the charge applies only to United States Steel Corp. (assuming, as charged, that its subsidiaries Illinois Steel Co. and Carnegie Steel Co. act under its direction and control) because its subsidiaries in the Chicago district sell the products of their mills to consumers in that district at prices higher than is charged for the products of its subsidiaries in the Pittsburgh district to consumers in the Pittsburgh district, although, as is alleged, the cost of production is no greater in the Chicago district than in the Pittsburgh district.

It is apparent that his charge against United States Steel Corp. in no way involves the propriety of the use of the Pittsburgh base in quoting prices, because the result would be the same whether the price charged in the Chicago district were *(a)* the price charged in the Pittsburgh district plus $5, as the freight from Pittsburgh to Chicago, or *(b)* a price $5 a ton higher than the price for the same product in the Pittsburgh district. The resulting price to the consumer would be the same in either case.

We are, therefore, brought face to face with the question whether the practice of United States Steel Corp. (treating the matter as if it owned and operated the mills of its subsidiaries) in charging higher prices for its products in the Chicago district than it charges in the Pittsburgh district is in violation of Section 2 of the Clayton act. For the reasons stated in Subdivision V hereof, the decision of this question will vitally affect the steel manufacturers whose mills are in other districts and the steel trade and business generally.

III. If the practice complained of be declared a violation of Section 2 of the Clayton act the effect would be to prevent a manufacturer from taking advantage of the favorable location of his mills with respect to his competitors and the operation of the law of supply and demand, to fix prices and to restrain rather than promote competition.

It seems too clear for argument that a manufacturer whose only mill is in the Chicago district is free to charge any price he can obtain under the competitive conditions prevailing in that district, even though his profit be larger than that of the manufacturer in the Pittsburgh district who sells his product in that district or in the Chicago district; provided, of course, that the effect of any discrimination in price (if it shall not be within the exceptions stated in Section 2 of the Clayton act) may not be substantially to lessen competition or tend to create a monopoly. Presumably the purpose of the manufacturer in locating his mill in the Chicago district was to gain an advantage over the manufacturer whose mills were located in the Pittsburgh district or elsewhere at a considerable distance from Chicago and who in making prices for the Chicago district has to consider the item of freight.

It is equally clear that the manufacturer whose mill is in the Pittsburgh district is free to make any price that may be necessary to effect the sale of his products in the Chicago district under the competitive conditions prevailing in that district, even though that price, less the freight from Pittsburgh to Chicago, be lower than his Pittsburgh price, because the effect of such sales can hardly be to lessen competition or to tend to create a monopoly. He is certainly free to make any reduction in price necessary to meet the competition of the manufacturers of the Chicago district; otherwise, there would be a restriction of competition and the manufacturers having mills in the Chicago district would have an unfair advantage.

The same results should follow in the case of a manufacturer who has plants in both the Pittsburgh district and the Chicago district. Such manufacturer should be free to secure for the products of his mill in the Chicago district the best prices obtainable under the competitive conditions in that district, even though the products of his mill in the Chicago district are sold at higher prices and at a better profit than the products of his Pittsburgh mills marketed in the Pittsburgh district.

If United States Steel Corp. can get a higher price in the Chicago district for the products of its mills in the Chicago district than for the products of its mills in the Pittsburgh district, it is not because of the Pittsburgh base, but because competitive conditions make the higher price possible. The fact is that the mills in the Chicago district do not supply even one-half of the steel consumed in that district. The remainder must come from the mills outside of that district, chiefly those in the Pittsburgh district, the cost of the products of which to consumers in the Chicago district must of necessity include the freight from the mills to the point of delivery in the Chicago district. Therefore, in normal times the prices charged by the manufacturers in the Pittsburgh district for their products delivered in the Chicago district will necessarily control prices in the Chicago district, even though the result may be that the manufacturers in the Chicago district make a larger profit upon their product than is made by those in the Pittsburgh district.

If the time shall ever come when the mills in the Chicago district have sufficient capacity to supply all the needs of that district and can continue to manufacture as cheaply as the mills of the Pittsburgh district, then the owners of the mills in the Chicago district, in normal times, will naturally have the trade of that district to themselves and the owners of the other mills will be excluded from competition.

It thus appears that the difficulty which the Chicago district fabricators experience in doing business outside of their own territory is due not to the effect of the use of the Pittsburgh base in quoting prices or to any discrimination in price on the part of the manufacturers against the Chicago district, but to the fact that their fabricating plants are located in the Chicago district, which does not produce enough steel to supply their demands, and the fact that steel shipped from Pittsburgh (from which a very large part of the steel consumed in the Chicago district must come) costs in the Chicago district several dollars more per ton to the manufacturers than steel produced at mills in the Chicago district. Such fabricators are able to compete in the Chicago district on somewhat better than equal terms with the eastern fabricators, because the freight rate paid by the eastern fabricators upon their finished product from their mills to points in the Chicago district is higher than the freight rate paid by the Chicago fabricators on the steel which enters into their finished product.

IV. What the members of the petitioner desire is a fixing of prices which will result in enlarging their field of competition and narrowing the field of competition of their competitors—this without reference to the effect upon competition generally.

In the last analysis what the Chicago fabricators are seeking is not to secure relief from a discrimination in price against them, but to secure a discrimination in price in their favor, so that they may be able to enlarge their territory and overcome the handicap now resulting from the fact that the price of steel is higher in Chicago than in Pittsburgh —a handicap which, as has been already pointed out, is due solely to competitive conditions and not to any arbitrary fixing of prices by the manufacturers or to discrimination. A fabricator in St. Louis, where there is no steel mill, might with equal justice complain of his inability to compete with the Chicago fabricator because the cost of his fabricated steel to the Chicago consumer would necessarily be increased by the freight from St. Louis to Chicago.

The members of the petitioner obviously desire to be able to buy at the Pittsburgh price all the steel produced in the Chicago district, and to buy from the Pittsburgh district at the Pittsburgh price, plus freight, enough additional steel to meet their demands. As the freight rate on rolled steel is less than that on fabricated steel, it would be impossible for Pittsburgh fabricators to compete in the Chicago district at all. The members of the petitioner, on the contrary, would then have, not only a

protective tariff amounting to the difference between the freight rate on rolled steel and that on fabricated steel, but also, to the extent that they could purchase rolled steel in the Chicago district at the Pittsburgh price, a protective tariff amounting to the entire freight rate on fabricated steel from Pittsburgh to Chicago. They would thus be able to establish a complete monopoly in their district, and it may well be questioned whether they would not resist any attempt to restrict their selling price to cost plus a reasonable profit.

If United States Steel Corp. were forbidden to sell in the Chicago district the output of its mills in that district at a price higher than that at which it sells in the Pittsburgh district the output of its mills in that district, or, to put it more positively and concretely, were required to sell in the Chicago district the products of its mills in that district at a price not to exceed cost plus a reasonable profit, the result to the members of the petitioner would not be what they seek. What the result would be would depend on where United States Steel Corp. sold the products of its mills in the Chicago district. If it chose to sell those products to consumers outside of the Chicago district the condition complained of would continue or would perhaps be made worse. If it chose to sell to consumers in the Chicago district the effect would be to lessen competition. The other manufacturers in the Chicago district would not find it necessary to lower their prices until the capacity of the mills of United States Steel Corp. in the Chicago district should be increased so that their products would be sufficiently substantially to meet the demand of that district, for they could continue with their existing prices to compete successfully with the manufacturers in the Pittsburgh district and other districts east of the Chicago district. Until such mills had so increased their capacity, competition between fabricators in the Chicago district would be very much disturbed and confused, if not substantially lessened: first, because only favored fabricators would get the lower priced steel, with the result that instead of all the fabricators being in competition for construction work in the Chicago district, they would be divided into two classes, the favored fabricators and the others, the second of which could not compete with the other; and secondly, because, with the price of steel in the Chicago district fixed lower than the law of supply and demand requires, the tendency would be to prevent the manufacturers (other than United States Steel Corp.) whose mills are outside of the Chicago district and who now compete with the manufacturers whose mills are located in the Chicago district from continuing to bid for the Chicago business. By reason of this shrinkage in their source of supply, the fabricators in the Chicago district would find that their field of competition was a correspondingly more restricted one and that such increased restriction would continue, at least until the supply of the mills of United States Steel Corp. in the Chicago district had been exhausted.

Even if all the manufacturers in the Chicago district could be required to sell at the lower price, it is apparent that in normal times the same unfavorable conditions would obtain. Although the confusion at such times might be somewhat less, it would still exist and not only the fabricators but the ultimate consumers, *i. e.*, the owners, would experience unnatural and unfair results. One owner putting up a building, whether for purposes of sale or rent, would necessarily have to pay more for his building than another because the one would have to pay more for his steel than the other. The latter will have been artificially favored.

It is submitted that the law of supply and demand should not be disturbed and that the incentive to invest money in steel mills in the Chicago district should not be diminished. The policy of our laws has been to allow the law of supply and demand the fullest play and to protect its operation from the interference of artificial influences. The petition herein seeks to disturb it and we believe that injury is bound to result.

V. Why steel producers generally are interested in the decision of the question involved.

The question may be asked why the steel manufacturer whose only mills are in the Pittsburgh district or elsewhere outside of the Chicago district is interested in the question involved herein, inasmuch as the granting of the relief sought would affect only United States Steel Corp., which through its subsidiaries, has mills in both the Pittsburgh and Chicago districts. The answer is simple. The mills of manufacturers of iron and steel have been located at the particular places because their owners have seen some advantage in locating them there. This advantage may be because of nearness to the ore or coal supply, or because of favorable transportation rates on raw material or finished products, or because the supply of finished products manufactured in a particular district was small compared with the demand therefor. Undoubtedly most of these reasons caused the owners of the mills in the Chicago district to locate them there. A prohibition against taking advantage of a favorable location could not be limited to United States Steel Corp. in respect of the mills of its subsidiaries in the Chicago district, and if it should be decided that none of the manufacturers in that district can be allowed to take advantage of their favorable location or, in other words, that the operation of the law of supply and demand must be restricted, then similar applications by consumers of steel in other districts would inevitably follow with similar decisions, and similar confusion and disturbance would result all over the country.

This precedent, once established, could not be limited in its application to manufacturers of iron and steel, but, on applications which would surely be made by consumers of other products, would necessarily have to be applied to other manufacturers, with the result that the natural laws upon which business has been founded since the beginning of civilization would be upset. The effect of such a decision would be far reaching. The advantages which induce investments in plants being negatived, loss of such investments to a considerable extent at least would follow and business chaos might well be expected.

The effect of the application of such a precedent upon the structure of the freight rates of the country should also be considered. That structure has been built up with a view to promoting competition by equalizing competitive conditions to the largest extent consistent with the interests of the carriers. If the principle upon which the granting of the relief sought by the petitioner herein must be based were logically applied to all the business of the country, a readjustment of freight rates would necessarily follow and the confusion mentioned above would be greatly increased.

We sincerely trust that this commission will not venture even a short way upon such a course, but will promptly decide that the business success of the country requires that the freest play be given to the law of supply and demand and will, therefore, dismiss the application herein.

Change Would Help Corporation

BY F. W. BEACH, GENERAL MANAGER OF SALES,

Mansfield Sheet & Tin Plate Co., Mansfield, O.

THE practice of using Pittsburgh as a basing point on all iron and steel shipments may possibly not be defended as a strictly logical principle, yet the custom dates back to the time when the industry really started in Pittsburgh. No doubt at all, that was the cheapest point of production and the cheapest point for the assembling of raw material, hence the cheapest place for production.

If the iron and steel industry should discontinue the use of Pittsburgh as a basing point, there is no logical reason why every community in the United States where iron and steel are produced should not be made a separate basing point.

If only the Chicago district were concerned, then a solution might be found. It requires no prescience to conclude that other regions such as Birmingham, Ala., Pueblo, Colo., Cleveland, Youngstown, O. (and the entire Mahoning valley), many other points in the state of Ohio, Philadelphia, Duluth, Minn., Wheeling, W. Va., Buffalo, N. Y., the New England section, and others will set forth claims for basing points. This would certainly bring about a very chaotic condition. Skilled labor on sheet and tin mills are compensated upon a sliding scale basis, as an example, when the price of sheet steel advances 5 cents per 100 pounds, the men's wages automatically advance 2½ per cent, and reductions accordingly. Therefore, the wages of the thousands of men employed by the industry are standardized, and if each locality should have a different basing point, you will readily see that it will be the means of bringing about a condition which will dissatisfy these men. The consuming trade have established their business to meet the existing conditions, and any radical changes would certainly disturb all relations with the mills, as well as with all of the buyers. The ultimate result would be that every producer and

consumer would be largely limited to their own particular zones, thus cut off largely from other centers by freight rates. In our own case, assuming Chicago as a basing point, we could not absorb the freight from Mansfield to Chicago district without loss. The establishment of Chicago as a basing point would certainly act as a hardship to every independent manufacturer of steel, and the only company who would have any advantages under such conditions would be the United States Steel Corp., with its many subsidiary companies scattered in practically all of the abovementioned centers. *This in itself is reason enough for not disturbing the present arrangement.* While theoretically every community should enjoy the advantages and suffer the disadvantages of its natural geographical location, other industries not having been established upon this basis, the question becomes one of weighing the advantages which would be derived from a change against the disturbance which would result, especially at a time when the industries are faced with a solution of many disturbing factors resulting from war conditions.

Your commission, no doubt, will find this to be a more complicated matter to determine, what you must avoid doing than to determine what you ought to do if the way were clear. Almost anything you might be disposed to do would be likely to involve you in something else. For instance, if you should order Chicago district mills to sell f.o.b. Chicago at f.o.b. Pittsburgh price, you will be ordering one mill to sell at another mill's price. It might be difficult to draw a line and avoid, in substance, ordering one Pittsburgh mill to sell at another Pittsburgh mill's price. Eventually your commission would be fixing prices for the entire iron and steel industry. If there were deviations, whom would the commission punish, those who sold below the set price, or those who exacted a higher price?

Should the decision merely be that a mill must not quote on a remote basis, but only f.o.b. the respective mill, there would be a change in form, but not in substance. The mills would take the Pittsburgh price, add the freight to destination point, deduct the freight from its mill, and quote the resulting price at the mill.

Summing up the entire situation, no one is now injured when buying on one common basing point, viz., f.o.b. Pittsburgh, why change? It seems advisable to leave well enough alone, making no attempt to destroy or change the present established market center of the country.

Southern Consumers Opposed

TOMLIN-HARRIS MACHINERY CO.,

Cordel, Ga.

THE application of the Western Association of Rolled Steel Consumers for a complaint against the United States Steel Corp., and others, should in our opinion be granted to the Chicago district, and territory tributary thereto, and not only should this be done, but the Birmingham district, and territory tributary thereto should be included, for as we understand it, Judge Gary and Mr. Schwab of the United States Steel Corp. have stated that steel could be produced as cheaply or cheaper in the Birmingham district than in any other place in the United States, and this being true, it is unduly prejudicial to the western and southern consumers of steel articles to pay a price for these articles based on the Pittsburgh price plus freight from Pittsburgh to destination, while the freight from Birmingham to destination might be and in all instances in the south, are considerably lower.

ATHENS FOUNDRY MACHINE WORKS,

Athens, Ga.

IN READING the application of the Western Association of Rolled Steel Consumers for complaint against the United States Steel Corp., and others, we feel that a great injustice is being done the manufacturers of the south in that we have to base our prices on Pittsburgh instead of some southern point. Wherein if the South could have a basing point say at Birmingham, Ala., and the West at Chicago we would save $6.20 per ton which would then allow us to compete with eastern manufacturers not only in our own city but would allow us to reach out into other fields.

As it now stands with Pittsburgh as a basing point we cannot compete with the eastern manufacturers in our own city due solely to the difference in base price which is based on Pittsburgh at a difference of freight rate of $6.20 per ton.

We are a small concern and would use only about 100 tons per year but the difference between prices being based on Birmingham, Ala., and based on Pittsburgh freight rates would be enough to pay 5 per cent on our capital.

We feel that your commission should grant the application and should establish at least three basing points for rolled steel, say one at Pittsburgh for the east and north, one at Chicago for the west and north and one at Birmingham for the south and west.

BRUNSWICK MARINE CONSTRUCTION CO.,

Brunswick, Ga.

WE HEARTILY endorse the complaint of the West Association of Rolled Steel Consumers. We use a large quantity of steel both for general manufacturing purposes and for steel shipbuilding. In competition with concerns located in eastern territory for the sale of manufactured articles, you can readily see that they can sell in our territory at a lower price than we can sell in theirs, because, while we receive our steel from Birmingham, from which point the freight rate to Brunswick is only 25 cents per 100 pounds, we pay the rate from Pittsburgh, which is 59 cents, whereas, the northern and eastern manufacturer, who actually receives his steel from the Pittsburgh district, pays only the actual freight rate from that point.

The same situation exists in connection with steel shipbuilding. Our steel plates come direct from Birmingham, from which point the freight rate of 25 cents to Brunswick is practically the same as the rate from Pittsburgh to shipbuilding points on the Delaware river. Yet instead of paying the actual rate, we are charged 59 cents per 100 pounds, on the theoretical Pittsburgh basis—or more than twice the freight rate that our northern competitors pay.

After looking into the situation, the federal trade commission will see that the present condition is unjust to the South as a whole, and we hope will have such measures adopted as will render it unnecessary for the southern rolled stock consumer to pay more than the actual freight rate from point of shipment.

SOUTHERN BRIDGE CO.,

Birmingham

AT present we obtain a certain proportion of our rolled steel shapes, say 60 per cent or greater, from local mills in this district, on which we pay at the rate of Pittsburgh base plus $3 per ton.

In competition with fabricators from the Pittsburgh territory to points north we are thus placed at a disadvantage, for, assuming that our costs of fabrication are the same as that of fabricators in the Pittsburgh district, we are handicapped in the sum of $3 per ton in bidding on fabricated steel work to points that carry an equal freight rate between this city and Pittsburgh.

Upholds Base

BY L. E. THOMAS, PRESIDENT,

Reading Iron Co., Reading, Pa.

IN reference to the complaint received by your honorable commission from the Western Association of Rolled Steel Consumers, regarding the discontinuance of Pittsburgh as a basing point, I beg to advise that the continuance of this practice is of vital importance to this company.

The raw material consumed by us in the manufacture of our product, which consists of wrought iron pipe and tubing, comes almost exclusively from the coal regions of western Pennsylvania, and the ore mines of the lake regions, placing us at a distinct disadvantage with our principal competitors, all of whom are located in the Pittsburgh district. Furthermore, 75 per cent and upwards of our finished product is shipped to the west and southwest, passing through Pittsburgh, placing us at a further disadvantage in the matter of freight in the distribution of our product, as compared with our competitors.

The machinists' union representing toolmakers and skilled hands in all of the greater Boston districts held a meeting recently and decided upon a new wage scale, providing for 90 cents an hour, together with a 44-hour week.

Men of the Iron Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

HORTON PENROSE, general manager of Shimer & Co., Philadelphia, Pittsburgh, and San Francisco, has resigned and will give his entire attention to the Penmore Fuel & Iron Co., in which he has been interested for some time. Mr. Penrose was resident manager in the Pittsburgh district for Shimer & Co. for several years, relinquishing this position to become general manager a little more than a year ago. He has been connected with the iron and steel business for the past 15 years, having previously been connected with the traffic department of the Baltimore & Ohio railroad. Ferdinand G. Schultz has resigned as Pittsburgh district sales manager for Shimer & Co., effective Oct. 1. Mr. Schultz has no definite plans as to future activities after that date.

John Blume formerly with the Holt Mfg. Co., Peoria, Ill., has been made assistant foundry superintendent for the Avery Co., Peoria.

C. Sinclair Weeks and A. Stanley North have been elected assistant cashiers of the First National Bank of Boston.

Charles F. Pace has been made district sales manager of the Hutchins Car Roofing Co., Chicago, and has opened offices in the Railway Exchange building, St. Louis.

L. R. Custer, formerly development engineer for the Midvale Steel & Ordnance Co., recently was elected vice president of the Cambria Steel Co.

George W. Bender, district manager at the New York office of Mudge & Co., Chicago, has been made manager of sales and service with headquarters in Chicago.

L. E. Purnell recently has been made district manager at Cleveland for the Ajax Metal Co., Philadelphia. The new offices of the company are in the Schofield building, Cleveland.

V. L. Curran has resigned as purchasing agent of the Sparks-Withington Co., Jackson, Mich., to become general manager of the Jackson Screw Products Co., that city. He has been succeeded by James T. Beadle.

John C. Moran, for the past year purchasing agent for the Lord Construction Co., Providence, R. I., has been appointed naturalization examiner for the district of Rhode Island.

E. M. Champion, former factory manager of the Bay City, Mich., plant of the C. R. Wilson Body Co., has been appointed factory manager in charge of production of the main plant in Detroit.

John C. Craig, formerly assistant superintendent, recently became superintendent of the rolling mills of the Steelton, Pa., works of the Bethlehem Steel Co., succeeding W. W. Leck, resigned.

Frank B. Roth, formery president of the Philadelphia chapter of the American Association of Engineers has been made chief engineer of the Lehigh Structural Steel Co., Allentown, Pa.

Auguste Griffoul who for the past few years has been foreman of the brass foundry department of Babcock & Wilcox Co., Barberton, O., has accepted a position as superintendent of foundries for the Flour City Ornamental Iron Co., Minneapolis.

Herbert DuPuy, chairman of the board of directors of the Crucible Steel Co. of America, who recently underwent an operation at the French hospital in New York City, is reported to be making good progress toward recovery.

H. Earl Sweitzer has been made sales manager in charge of sales and advertising, of the Allsteelequip Co., Aurora, Ill. For about one year he has been assistant sales manager and prior to that time was advertising manager of the Appleton Mfg. Co., Batavia, Ill., for several years.

G. H. Dorr, Washington, assistant director of munitions, who, since the signing of the armistice has been in charge of the work of cancellation of contracts, has resigned and will resume the practice of law in New York. His successor has not been named.

Joel B. Ives, of the engineering and contracting departments of the American Steel Export Co., New York City, has sailed for Italy. He will confer with the export company's agent, M. Ferraris & Co., on matters referring to the Italian market for steel and metal products including machinery and equipment.

W. Edward Lindsay has been made engineer for the Lancaster Structural & Foundry Works, Lancaster, Pa., which company has purchased the property of the Lancaster Machine & Structural Works. Edgar G. Hess, formerly connected with the Lancaster Foundry Co., has been made works manager of the Lancaster Structural & Foundry Works.

Ray M. Cheney who has been with the Badger Co., Boston for the past two years, has resigned to take charge of a foundry near Calcutta, India, for the Bemis Brothers Bag Co., Boston. The Bemis Brothers company has a large jute textile mill in India for which they propose to construct all required machinery in that country, owing to the high importing costs.

E. Phelps Langworthy, formerly assistant works manager of the American Steel Foundry, Indiana Harbor, Ind., has been made manager of the steel castings plant of the American Radiator Co., Buffalo. G. W. Merrefield, formerly with the Clark Equipment Co., Buchanan, Mich., has been appointed assistant to Mr. Langworthy and will have charge of sales.

Donald H. C. Tulloch, former secretary of Boston branch, National Metal Trades association, has been elected secretary of the Manufacturers association of Jackson, Mich. He resigned his Boston position to enter the service and was commissioned a lieutenant in the C. A. C. Before going to Boston he was secretary of the Employers' association of Berkshire county, Mass., with headquarters in Pittsfield.

E. M. Mentzer has been promoted to be manager of the tin plate plant of the Weirton Steel Co., Weirton, W. Va., succeeding J. C. Griffin, who resigned recently to become affiliated with the Bethlehem Steel Co. Mr. Mentzer formerly was manager of the Weirton company's tin plate plant at Steubenville, O., in which capacity he is succeeded by W. F. Singer, formerly assistant to J. C. Williams, general manager of the Weirton Steel Co.

Men of the Machinery Trade

Personal News of a Business Character Regarding the Men of Affairs of the Industry

G P. GOODMAN, who for several years has represented the Hisey-Wolf Machine Co., Cincinnati, in the east, will on Oct. 1, take charge of the portable tool department of F. H. Niles & Co., Inc., New York City. This company handles not only the Hisey-Wolf line of electric machine tools but the pneumatic hammers and drills manufactured by the Pittsburgh Pneumatic Co. Other changes in the Niles company are the appointment of F. H. Crawford as secretary and J. E. Haetten as sales manager.

Anthony Dobson has been placed in charge of a newly established Detroit branch office of the Carborundum Co., Niagara Falls, N. Y.

S. S. Newton recently resigned as president and director of the Luther Grinder Mfg. Co., Milwaukee, after 18 years of service. He is succeeded by W. T. Hardy.

Jay V. Hall, former general sales manager of the Olds Motor Works, Lansing, Mich., has joined the executive staff of the Willys Corp. at its Duesenberg plant.

David H. G. Penny, vice president, in charge of the foreign department of the National Bank of Commerce, New York, sailed for Europe, Sept. 18, to confer with the foreign representatives of the bank.

Carl F. Dietz, vice president and sales manager of the Norton Co., Worcester, Mass., is to sail the latter part of the month on a European trip that will keep him away until about the first of the year. He is to establish new sales agencies in several foreign countries.

Otto J. Lof, for several years representative in Germany of the Norton Co., Worcester, Mass., who returned a few months ago after having been interned during the war, has sailed for Europe, having been assigned a new district, comprising Norway, Sweden and Denmark.

Jesse G. Vincent, vice president of the Packard Motor Car Co., Detroit, has been commissioned a colonel in the United States officers' reserve corps aviation section of the signal corps in recognition of valuable services rendered the war department in perfection of the Liberty motor.

W. C. Irwin has been made district sales representative for St. Louis and the southwest, with headquarters in the Frisco building, St. Louis, for the Dunbar Mfg. Co., of Chicago.

M. W. Seeman, sales engineer of the Cleveland Osborn Mfg. Co., Cleveland, has been appointed director of European sales of this company with headquarters in London. Mr. Seeman will promote the sale of the extensive line of molding machines manufactured by the Cleveland Osborn Mfg. Co. throughout Europe.

Henry J. Gross, formerly vice president and general manager of the Norcross Bros. Co., Worcester, Mass., is now vice president and treasurer of the recently amalgamated building firm of Anglin-Norcross, Ltd., Montreal. It has taken over the Canadian interests of the Norcross Bros. Co., which is liquidating its affairs.

Dr. George C. Barlow resigned recently as president of the United States Tractor & Machinery Co., Menasha, Wis., due to poor health. Joseph G. Sailor, formerly president of the Sailor-Whitmore Machine Co., that city, who has been vice president of the United States company for some time succeeds him as president.

A. A. Gloetzner has been elected president and general manager of the Covert Gear Co., Inc., Detroit, succeeding P. A. Clum as president. Since early this year he has been vice president and prior to that he was chief engineer and manager of sales. He will make his headquarters in the Lockport, N. Y., office of the company, spending two days weekly in Detroit.

Henry Blanchard, sales representative at Chicago for the Baldwin Locomotive Works and the Standard Steel Works Co., has been made manager of a branch sales office in the Merchants National Bank building, St. Paul, Minn.

Walter E. Flanders, of Detroit, who recently resigned as head of the Maxwell Motor Co., has become identified with the L. D. Rockwell Co., manufacturers' agents for the Precision Die Casting Co., Dahlstrom Metallic Door Co., Delaware Seamless Steel Tube Co., American Tube & Stamping Co., Donner Steel Co., and other firms, with offices in the Book building, Detroit. Mr. Rockwell was formerly with the Standard Welding Co.

George W. Crane now is president of the Seneca Falls Mfg. Co., Inc., Seneca Falls, N. Y., builder of lathes, etc., succeeding Marshall J. Root, who recently became vice president of the Fairbanks Co., New York. Since 1900, Mr. Crane has been affiliated with Pierce, Butler & Pierce Corp., Syracuse, N. Y., manufacturer of boilers, radiators, etc. He commenced as timekeeper, later became salesman and finally assistant sales manager.

Charles Riddell, formerly manager of the Chicago office of the Baldwin Locomotive Works and the Standard Steel Works Co., has returned to his duties in Chicago after an absence of 18 months on special duty at the Philadelphia office. Arthur S. Goble, who has been in charge of the Chicago office, has been made manager of the St. Louis office.

Albert E. Newton, vice president and general manager of the Reed-Prentice Co., Worcester, Mass., president of the National Machine Tool Builders association, and vice president of the National Metal Trades association, has withheld the use of his name as president of the latter organization at its next annual meeting. It is expected he will be re-elected president of the National Machine Tool Builders association, at its annual meeting.

Henry W. Benkart has been appointed Buffalo representative for the Lakewood Engineering Co., Cleveland. His offices are located in the Ellicott Square building and he will devote his efforts to the general construction field. His experience in the construction business covers a period of about 10 years, the greater portion of which time he was superintendent of construction for the Dravo Construction Co. For about five years, he has been agent for various companies manufacturing contractors' equipment, including the Lakewood company. Other lines have been discontinued and he now represents the Lakewood company exclusively.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

CONSTRUCTION of the plant of the recently organized Wyckoff Drawn Steel Co., at Ambridge, Pa., rapidly is nearing completion and in anticipation of having it in full operation in December, the company now is booking orders for delivery in the first quarter of 1920. The company, which is headed by A. W. Wyckoff, for several years engaged in the steel business and later as distributor in the Pittsburgh district of the Chalmers and Reo automobiles and who recently returned from war service in France, includes in its directorate several men prominent in business and financial circles in Pittsburgh.

The vice president of the company is G. R. Nutty, vice president of the Gulf Refining Co., Pittsburgh, while the directors include A. L. Humphrey, president of the Westinghouse Air-brake Co., Pittsburgh; William McConway Jr., vice president of the McConway & Torley Co., Pittsburgh, and R. B. Keating, vice president of the West Penn Power Co., Pittsburgh. J. J. Komara, formerly with the Columbia Steel & Shafting Co., Pittsburgh, is works manager of the company, and Joseph T. Somers, who is general manager of sales formerly was eastern district sales manager, with headquarters at Philadelphia, for the Columbia Steel & Shafting Co.

The plant of the company will have an initial capacity of 5000 tons a month of cold drawn rounds, squares, hexagons, special shapes, screw stock and alloy steel, but provision has been made for plant enlargements and increased production. All equipment for the plant has been purchased and now is in process of installation.

* * *

THE New Britain Machine Co., New Britain, Conn., is about to begin making a moderate-priced farm tractor to be known as the New Britain. Edward Glass is in charge of production.

* * *

THE South Beloit, Wis., plant of the Stewart Speedometer Corp. will be doubled in size and the force of employes will be increased more than 600 within the next six months, according to G. J. Behrendt, general manager of the Beloit shop. Production will be greatly increased after new machinery is installed.

* * *

INSTALLATION of additional pulverizing and drying machinery recently was completed by the Franklin Soapstone Corp., Henry, Va.

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AN ELECTRIC furnace has just been ordered from the Electric Furnace Construction Co., Philadelphia, by the Vancouver Engineering Works, Ltd., Vancouver, B. C.

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THE Continental Axle Co., Edgerton, Wis., which has been incorporated with $200,000 capital to manufacture motor truck, trailer and tractor axles, has elected the following officers: President, Andrew McIntosh; vice president, James Higgins, Racine, Wis.; secretary, E. L. Menhall; treasurer, William McIntosh; general manager, James W. Menhall. Work is progressing on the new machine shop which the company is building at Edgerton and which will be ready about Nov. 1.

* * *

THE James Mfg. Co., Fort Atkinson, Wis., maker of steel stanchions, bubbler fountains and other dairy farm specialties, is reported to be undertaking a $150,000 works improvement program which includes provision for complete malleable and gray-iron foundries as well as additions to the machine shop, sheet metal department and other shops. Plans are being prepared for a brick and steel addition, 100 x 450 feet, work on which will begin shortly after Sept. 15. W. D. James is president and general manager.

* * *

ENGAGED in the manufacture of drills for boring square and hexagonal holes as well as chucks for the drills, the Detroit Hexagon Drill Co., Detroit, has had to lease a 4-story building with basement. This gives it 50,000 square feet of floor space at the corner of Woodward and Atwater avenues and equipment now is being installed. The company's old machinery is being removed to the new address but it soon will be necessary to install new screw machines and grinders, since at present two outside concerns are making its product. The company is incorporated for $300,000, $200,000 of which is paid in. J. W. Donaldson is president and treasurer; William T. Manning, vice president; Earle R. Trombly, secretary; W. A. Smith, general manager. These with W. E. Brown, chief mechanical and electrical engineer for the Great Lakes Engineering Co., complete the board of directors. Mr. Smith also is identified with the Russell Wheel & Foundry Co., Detroit.

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WITH its head office at Jackson, Tenn., the Martin Tool Holder Co., has been incorporated at $100,000. The company was organized for the purpose of manufacturing and selling a tool holder invented by T. O. Martin. To meet the large demand several machine tool manufacturers have been asked to manufacture the holder under contract. The company contemplates the building and equipping of a plant in the near future. R. L. Beare is president; I. A. Rainey, secretary and treasurer; R. F. Spragins is director and attorney; T. O. Martin is general manager.

* * *

THE Oneida Electric Truck Co., Green Bay, Wis., is being organized with a capital stock of $300,000 by local business men and officers and stockholders in the Oneida Motor Truck Co., also a $300,000 corporation which for over two years has been manufacturing gasoline commercial cars in Green Bay. The new company has taken over basic patents on an electric truck design which has been employed in a fleet of 50 cars used for the past year by the American Railway Express. For the present the electric truck will be manufactured in the present plant of the Oneida Motor Truck Co., together with gasoline cars. Officers of the new corporation are: John T. Phillips, president; F. H. Bogart, vice president; William Hoberg, treasurer; S. H. Cady, secretary. Mr. Bogart is vice president and factory manager of the old Oneida company. LaFayette Markle, president and general manager of the existing concern, is a director in the new corporation.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

THE foundry department of the Globe Co., Sheboygan, Wis., formerly the Globe Foundry & Machine Co., has been organized as a separate corporation known as the Globe Foundry Co., with a capital stock of $100,000, and will start work about Oct. 1 on the erection of a new gray iron foundry. When this is ready, the present Globe foundry will be converted into an addition to the machine shop now a part of the works. The Globe Co. is the outgrowth of the Honold Mfg. Co., of Sheboygan, which two and a half years ago purchased the plant and business of the Globe Foundry & Machine Co., and changed the name to the Globe Co. It has outgrown the present works and to facilitate development a new corporation has been formed, having the effect of separating the foundry and machine shops. G. F. Honold and Fred Leicht of the Globe Co. appear as incorporators of the new company with Gus A. DeWilde Jr., of Sheboygan, who becomes a stockholder and officer. Plans are being prepared for a new brick and steel casting shop to cost about $75,000. Later purchases of considerable new tool equipment will be made.

* * *

THE Wilton Tool & Mfg. Co., Boston, has purchased a half acre with factory buildings in the Roxbury district in that city, of the Boston Belting Co., which it will occupy after extensive improvements have been made.

* * *

NEGOTIATIONS have just been concluded by which the Jordan Motor Car Co., Cleveland, has purchased the property of the Metal Parts Mfg. Co., adjoining the Jordan company's factory. Edward S. Jordan, president of the automobile company, said acquisition of the metal parts property will increase the ground area occupied by the Jordan company by one-third, which will permit an increase of more than 30,000 square feet in floor space.

* * *

THE Barr Co. of Pittsburgh recently purchased the plant of the Loucks Iron & Steel Co., Roanoke, Va., including all of the equipment of the plant. The Barr Co. has begun work on dismantling the plant and selling the machinery and scrap. Equipment for a finishing mill, puddle mill, machine shop and pump house is included in the purchase.

* * *

THE Robbins & Myers Co., Springfield, O., is adding to its capital $2,500,000 to give greater scope in operations, it is announced. The company manufactures electric motors. It was organized in 1878 as a foundry. Sales last year amounted to $6,901,076, and officials state that orders this year will place this item around $9,000,000.

* * *

THE sum of $115,000 has been raised by popular subscription in Attleboro, Mass., to help finance the Mossberg Pressed Steel Co., a new corporation which will be managed by Frank Mossberg, president of the Frank Mossberg Co., makers of wrenches, etc., in that city. The new company has leased the plant of the Attleboro Steam & Electric Co. and will start operations immediately.

* * *

THE plant and equipment formerly owned by the Delta Foundry & Machine Corp. has been taken over by J. F. Shea, the plant's former manager. A new partnership between Mr. Shea and his former foreman, Mr. Dixon, has been formed to operate the plant on nonferrous casting work under the name of the Marine Castings Co., 116 Fifty-seventh street, Brooklyn, N. Y.

* * *

FREYNE, BRASSERT & CO., Peoples Gas building, Chicago, engineers, have been retained by the Lavino Furnace Co., Philadelphia, in connection with improvements being made at its Sheridan, Pa., blast furnace.

These engineers likewise have been retained by the Algoma Steel Corp., Sault Ste. Marie, Ont., as consulting and supervising engineers in the remodeling of its No. 4 blast furnace.

* * *

WITH the reorganization of the James Ohlen & Sons Saw Mfg. Co., Columbus, O., the merger of the Ohlen company and the George M. Bishop & Co., Lawrenceburg, Ind., is carried out. The name of the new company is the Ohlen-Bishop Mfg. Co. The two plants will be operated from a central office located in Columbus. E. D. Rogers is president of the merged companies; H. J. Bradbury, vice president; and L. W. Seymour, is secretary and general manager. The officers with J. J. Chester, Frank Macklin and R. V. Mitchell comprise the board of directors.

* * *

THE Fitzgerald Mfg. Co., Torrington, Conn., has just received from the General Motors Co. an order for 500,000 automobile horns. This is one of the largest orders for automobile parts ever awarded a Connecticut company. The Fitzgerald company has just completed a 2-story addition to its plant, and a large 3-story addition is planned for construction in the near future.

* * *

EXTENSIONS are contemplated by the Lima Locomotive Works, Lima, O., which will increase the plant's capacity approximately 50 per cent and which will involve an expenditure of $1,250,000. Additions will include a new erecting shop with a capacity of about 70 locomotives per month; a superheater shop extension to the boiler and tank shops; and additional power plant equipment. New machinery amounting to approximately $300,000 will be purchased. Plans have been completed but their carrying out is delayed because of the general labor condition.

* * *

THE Milwaukee Electric Crane & Mfg. Co., Milwaukee, has taken contracts for installing a 10-ton standard Milwaukee crane in the structural fabricating and erecting shop of the Lakeside Bridge & Steel Co., and a similar unit for the Worden-Allen Co., Milwaukee. A 15-ton Milwaukee foundry crane has been purchased by the Pelton Steel Co., Milwaukee. The Haskell & Barker Car Co., Michigan City, Ind., has contracted for two special wheel-handling cranes. The Jaeschke Bros. Foundry Co., Milwaukee, which is doubling the size of its gray iron foundry, will equip with one 5-ton and one 2-ton Milwaukee cranes.

Bolshevism Bankrupt—Hoover

Lenine's Theories Wrecked on Rock of Underproduction—Radicals in America Would Plunge Nation Into Insane Experiments—Only Hope for World is Work and Increased Production—General Financial News

BY JOHN W. HILL, FINANCIAL EDITOR

THE one great outstanding fact of the world today is the overwhelming unsatisfied demand for commodities. From every section of the United States and from every quarter of the globe this cry for goods and more goods is being heard. For four years the energies of 30,000,000 men in the world were diverted from peaceful pursuits to war. The ravages of war and disease combined have removed 10,000,000 able bodied men from the field of production. Consequently the world is incomprehensibly short of goods, while at the same time it is facing the task of supplying the deficiency with a working force depleted by 10 per cent as compared with prewar days.

Moreover the toilers that do remain are clamoring for shorter hours and engaging in industrial disputes and strikes, of which there have been 3000 in this country since the armistice. The reduction from a 10 to an 8-hour day, being generally insisted upon means a further curtailment of production of 20 per cent, for the argument is rarely heard now that a man can do as much in eight hours as in 10.

Despite all this, high wages are stimulating the demand for current wants, consequently the upbidding of luxuries and necessities is an important factor in soaring living costs. Obviously the watch-words of the world today should be "work" and "increased production."

Herbert Hoover, back from Europe last week, says Bolshevism is bankrupt—wrecked on the rock of underproduction. Russia has had its fling of Utopia—and it has starved. It has found that there is no magic which will turn laziness and idleness into riches or five and six hours of labor into 10 hours of production. Bolshevism won for labor fabulous wages, but labor under bolshevism failed to produce enough goods to begin to go around and the high wages meant nothing.

Lenine early saw the approaching economic collapse and he began to lure back the old experienced managers, with salaries unheard of before the war. These managers rode in state to the factories in luxurious limousines by the order of the "commissary." Now, according to Mr. Hoover, a widespread reaction has begun. The fashion of private ownership of land and factories, camouflaged somewhat at present, is coming back. Bolshevism in Russia given full rein is strangling itself.

Common Sense is Preached

Enlightened socialists honest with themselves are not blind to the folly of impeding the process of production. John Spargo says that "every serious student of the problem has realized the first great task of any socialist society must be to increase the productivity of labor," and that "it is all very well for propaganda among the masses to promise a great reduction in the hours of labor and at the same time a great improvement in the standards of living." This writer further admits that even if the capitalists were expropriated and the working class should come into possession of the organization of production "there would not be enough in the fund now going to the capitalist class to satisfy the requirements of the workers, even if not a penny were paid to the former owners."

But these things are not for the ears of the ignorant upon whose continued unenlightenment, combined with a plastic discontent, the agitator feeds. Like the unconscionable profiteers in necessities, who do not create but take advantage of a shortage of goods, the agitator is seeking to profit at the expense of a weakened, prostrate world, bewildered by the giant impact of a great war and by the strange unadjusted economic aspects of peace.

He has sought to inflame the masses by jangling incessantly the high cost of living harpstring, thereby causing appalling curtailment of production through strikes, when he knows that stimulated production is the one and only means to bring about a substantial and lasting decline in the prices of things. He is striving to stir up class consciousness among the wage earners who actually are better off than ever before, with wages higher in proportion to the cost of living than they ever received. He would fan their resentment against imagined wrongs and lull them with false promises, impossible of fulfillment. Behind these feverish attempts to advantage from the existing unsettlement there lies an insidious actuating motive in the minds of the radicals who now apparently control the American Federation of Labor.

They are not thinking of the welfare of their dupes because responsible labor leaders admit that higher wages and shorter hours at this time will merely serve to aggravate the high price sore. The real goal of the radicals is the overthrow of the existing social order. What else could be the significance of the defiance by the steel union heads of the pleas of President Wilson and Mr. Gompers an indication emphasized by the Boston police strike and the disclosure that police in 37 cities have been organized.

With the sworn protectors of lives and property under the absolute dictation of labor leaders, labor would be ready to impose the rule of the minority upon the majority. The Boston strike revealed the thin veneer which separates civilization from anarchy and has aroused the American people to the danger. The organization of police was a fatal error of the unions and the collapse of the Boston strike was a staggering blow. Without public sentiment labor cannot win a great strike and unions which would jeopardize not only the country's promised tremendous prosperity, but its institutions as well, in order, not to improve the conditions of workmen, but to compel surrender to the organizations will find themselves riding to an inevitable fall. America is not Russia and there will be no rule of the minority here.

To Absorb Other Works

At a special meeting Sept. 17 the stockholders of the Clinton-Wright Wire Co. voted to increase the capital stock from $12,500,000 to $16,000,000 and deferred action on changing the name to the General Wire Co. until an adjourned meeting Nov. 3. Some of the stockholders oppose depriving individual companies of their

identities because of their value as an asset. The resignation of Charles F. Fairbanks, Lexington, Mass., president and treasurer of the former Clinton Wire Cloth Co., as a director was accepted, he having resigned to devote all his time to the Eastern Specialty Mfg. Co., Boston. The stockholders filled the directorate to its legal number of 11 by the election of Harry W. Goddard, president and treasurer; Frank Kilmer, Grafton, Mass., secretary and assistant treasurer; and George M. Thompson, manager, all of the Spencer Wire Co., Worcester and Spencer, Mass., which was recently taken over. The company is anticipating further consolidations notably with some large steel company so that it may be supplied with raw materials.

French Form Steel Group

In order to deal in commercial, industrial and financial transactions for the purchase and sale of steel, with the exception of molding steel, an important French steel group has been formed under the name of Le Groupement des Sinistres du Nord et de L'Est. The nominal capital of the group has been fixed at 1,000,000 francs, and offices have been opened at 52 rue Taitbout, France. The group is composed of a number of firms the names of which are Societe des Acieries de Longwy; la Societe Anonyme des Usines de l'Esperance; la Societe Anonyme des Acieries de Micheville; la Compagnie des Forges et Acieries de la Marine et d'Homecourt; la Societe Metallurgique de Senelle-Maubeuge; Doremieux Fils et Cie, a Saint-Amand-Les-Eaux; la Societe Anonyme des Boulonneries de Bogny-Braux; la Societe en commandite Lefort et Cie.

Buys Tool Plant

The Fastfeed Drill & Tool Corp., 30 Church street, New York City, recently incorporated under the laws of New York, with a capital stock of $500,000, has purchased the factory at Toledo, O., operated by the McCarthy Drill & Tool Corp. J. D. McGrath, formerly treasurer of the McCarthy corporation, now is managing director of the new corporation.

The Fastfeed corporation will continue to operate the Toledo plant and will specialize in the exclusive manufacture of high-speed steel tools. Important additions to and improvements in the present equipment are planned and it is probable that an enlarged organization will be necessary to handle the contemplated increased production. For the present there will be no change in the operating staff.

Reorganize Company

Reorganization of the Hobbs Mfg. Co., Worcester, Mass., maker of paper box machinery, vending machines, nut locks and spring washers, and the increase of its capitalization from $300,000 to $700,000 has been announced. New York interests purchased the business November, 1918. The board of directors has been increased to seven.

Purchases Forge Shop

The Moore Drop Forge Co. has just completed its negotiations for the purchase of the Page-Storms Drop Forge & Wrench Mfg. Co., Chicopee, Mass., and has now assumed control of the business. This marks the practical closing out of Westinghouse interests in New England, for all of the common stock in the Moore Drop Forge Co. previously owned by the Westinghouse Co. has been purchased. The combined plants will be operated under one manager and will employ together, about 1000 men. The new officers will be: President and general manager, F. D. Fuller; treasurer, Albert H. Chapin; secretary, John M. Williams.

Profits From Shells

Shareholders of the Universal Tool Steel Co., Toronto, Ont., have received the annual report of the company for the year ending Dec. 31, last. This shows gross profits on shellmaking of $540,876, and a loss on boltmaking of $30,146. The net income for the year was $278,382. A dividend of 2 per cent on the common stock absorbed $189,824, and a dividend on the preferred shares amounted to $6000. The common stock outstanding is $9,500,000 and preferred $100,000. The company was busy on munitions practically up to the end of last year.

Financial Crop Ends

THE Vulcan Detinning Co., reports for the quarter ending June 30 net income after taxes and other charges, of $62,444 as compared with $45,999 in the corresponding period of 1918.

* * *

Amendments to its articles of incorporation have been filed by the Chain Belt Co., Milwaukee, increasing its capitalization from $1,000,000 to $2,800,000.

Export Demand

For Ammonium Sulphate Improves—By-products Market Firm

New York, Sept. 22.—An improved export demand is in evidence for sulphate of ammonia. Foreign buyers, particularly in the Orient, are inquiring on good tonnages, and a fairly good amount of trading is resulting. A drawback, however, to actual sales is the scarcity of spot material. Sizable shipments for some time past have been made by the producers, with the result that supplies now are relatively low. Domestic demand is quiet. The market on sulphate of ammonia may be quoted at $3.40 to $3.65, f.o.b. producers' plant for spot and $3.25 to $3.40 on contract orders.

Sellers of naphthalin are becoming further sold ahead. One leading seller is now unable to make shipments under Nov. 1. This sold-up condition applies particularly to flakes, although balls cannot be easily had under three or four weeks, it is understood. A feature of this market at present is a revival in the interest of the drug trade. These interests along with the dye manufacturers are bringing about considerable activity. Naphthalin, in flakes, is holding a 6½ to 7½ cents, f.o.b. producers' plants on spot and contract business, and naphthalin, in balls, 8½ to 9½ cents. These prices are unchanged from last week.

Prices of benzol are holding steady. Pure benzol is quoted at 24 to 29 cents and 90 per cent at 22 to 24 cents. Toluol also is strong, the market being around 26 to 30 cents.

Coke Oven By-Products

Spot

Per Gallon at Producers' Plant

Pure benzol	$0.25 to .29
Toluol	.26 to .30
Solvent naphtha	.22 to .27

Per Pound at Producers' Plants

Phenol	nominal
Naphthalin, flake	0.06½ to .07½
Naphthalin, balls	0.08½ to .09½

Per 100 Pounds at Producers' Plants

Sulphate of ammonia	3.40 to 3.65

Contract

Pure benzol	$0.25 to .29
Toluol	.26 to .30
Solvent naphtha	.22 to .27

Per Pound at Producers' Plant

Phenol	nominal
Naphthalin, flake	0.06½ to .07½
Naphthalin, balls	0.08½ to .09½

Per 100 Pounds Producers' Plants

Sulphate of ammonia	3.25 to 3.40

The capital stock of the Pettigrew Foundry Co., Harvey, Ill., has been increased from $15,000 to $100,000.

Heavy Equipment Sale Increases

Machine Tools Slacken in East But More Freely in Cleveland—Crane Awards Are Numerous in Pittsburgh and in New York Markets—Standard Oil Closes For 28 Jib Cranes For Bayway

CONTRASTING conditions are noted in the eastern and middle western machine tool markets. In the east tool trading last week was quieter than in several months, while in the middle west, sellers have been particularly active. Inquiries are fairly heavy and sizable orders are being placed. Some eastern buyers apparently are holding up their purchases until the air is cleared of strikes and while this condition is true in a small measure in Cleveland and surrounding territory, sellers generally believe the strike will be settled before it affects their business to an appreciable extent.

Crane activity abounds in practically every market. Sellers of this type of equipment claim they have all the business they can handle. In New York, crane awards on old inquiries are particularly heavy and considerable new inquiry is current. The largest closing is by the Standard Oil Co., for Bayway, N. J. on 28 jib cranes. It also bought a 25-ton overhead for Bayonne, N. J. Crane purchasers include the Phoenix Utilities Co., of Thousand Springs, Idaho; Lehigh Valley railroad, Ashmore, Pa.; Dilts Machine Works, Fulton, N. Y.; Honolulu Iron Works, New York City and the American Smelting & Refining Co. Electric cranes were purchased by the West Penn Power Co., and the United Gas & Electric Co., New York City, while locomotive crane purchasers include L. Brenner, Lebanon, Pa.; Peace Bros., Flushing, L. I., N. Y.; J. Lipsitz Co., Chelsea, Mass.; Beacon Oil Co., Boston, and Henry W. Peabody & Co., New York City. In Pittsburgh, four, five and six cranes were bought by the Kelly-Springfield Tire Co.; Interstate Iron & Steel Co., Chicago, and the Slick-Knox Co., Wheatland, Pa., respectively. The McKinney Steel Co., Cleveland, also was a recent purchaser of electric cranes.

Inquirers for cranes include the Carnegie Steel Co., which wants four 5-ton cranes but will probably take two each 5 and 10-ton; the American Metal Co., and the Phelps, Dodge Co., New York City, the latter wanting 12 overhead cranes; the Nazareth Foundry & Machine Co., Nazareth, Pa.; Hagameyer Trading Co., and American Trading Co., New York City.

Two fair sized inquiries for tools as well as many smaller ones are out in Cleveland, one for 28 tools from A. Bentley & Sons Co., Toledo, O., and one from the Canadian Fairbanks Co., Ltd., Montreal, Que., 15 tools, including some heavy equipment such as bulldozers, steam hammers, etc. The Baldwin Locomotive Works, Philadelphia, is supposed to have wound up its purchases for the present. Many automobile companies figure among the buyers in the middle west.

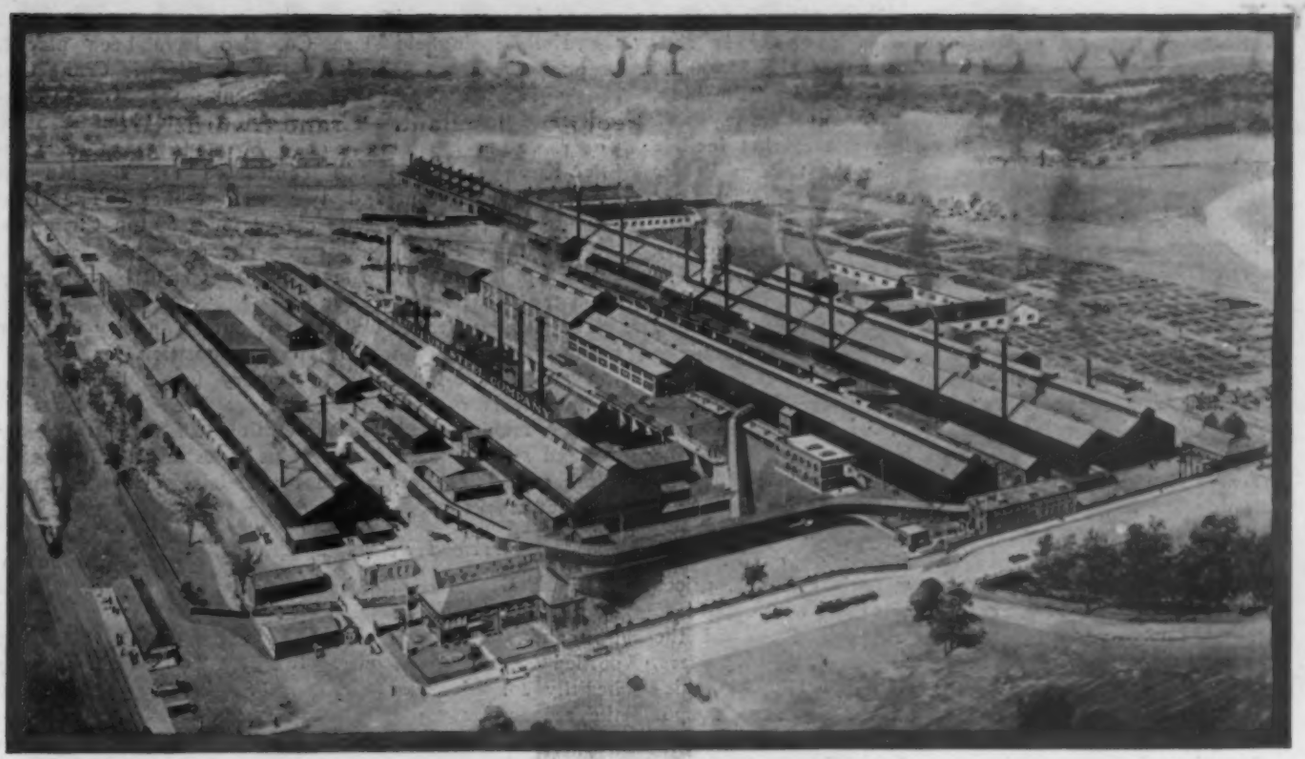
Prices have become stabilized and are near the wartime level. Deliveries on heavy machines are deferred about eight weeks; spot delivery being offered only on some types of lighter equipment.

Crane Awards Feature Eastern Equipment Mark

FEATURING the eastern equipment market is considerable activity in cranes. Numerous awards are being made, and several sizable new inquiries are out. The largest single award this week involved 28 jib cranes for the Bayway, N. J., plant of the Standard Oil Co. of New Jersey. Other orders include a 40-ton overhead crane for the Phoenix Utilities Co., for Thousand Springs, Idaho. This business was placed through the Electric Bond & Share Co., New York City, with the Toledo Bridge & Crane Co. The Whiting Foundry & Equipment Co. has been in receipt of considerable business. Orders booked by this company within the past few days include a 10-ton electric crane for the Lehigh Valley railroad, Ashmore, Pa.; a 5-ton electric crane for the Dilts Machine Works, Fulton, N. Y.; a 10-ton crane for the Honolulu Iron Works, with offices in New York City; a 10-ton electric crane for the American Smelting & Refining Co., for shipment to Mexico, and a 25-ton overhead crane for the Bayonne, N. J., plant of the Standard Oil Co.

New inquiries in the electric crane market include three cranes for the American Metal Co., New York City. One crane is to be of five tons capacity, and the remaining two of 10 tons capacity each. The Phelps-Dodge Corp., 99 John street, New York City, is in the market for 12 overhead cranes, ranging in capacity from five to 60 tons. The Nazareth Foundry & Machine Co., Nazareth, Pa., is inquiring for a 15-ton overhead crane. The Hagermeyer Trading Co., 17 Battery Place, New York City, is asking bids on a 7-ton traveling crane for export. The American Trading Co., 25 Broadstreet, New York City, is in the market for a small special crane for shipment to France.

Several sizable orders have been placed in the locomotive crane market. L. Brenner, scrap merchant, Lebanon, Pa., has bought a 15-ton Browning Crane. The American Car & Foundry Co., 165 Broadway, New York City, has purchased a 25-ton crane from the Orton & Steinbrenner Co. This latter company also has been awarded a 15-ton locomotive crane by J. Lipsitz, Chelsea, Mass. The Orton company also has been awarded a 15-ton crane by the Beacon Oil Co., Boston, Mass., and a 15-ton crane by Henry W. Peabody & Co., 17 Battery Place, New York City, for export. The Hugh Nawn Contracting Co., Fifth



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avenue and Forty-third street, New York City, is figuring on some conveying equipment. This company is contractor in charge with the construction of the $5,000,000 Gilboa dam in New York state. Peace Bros., Flushing, L. I., have bought a 15-ton used locomotive crane.

Additional awards in the electric crane market include a 5-ton bucket handling crane for the West Penn Power Co. This order was placed by Sanderson & Porter, 52 Williams street, New York City, with the Milwaukee Electric Crane & Mfg. Co. A similar crane was recently ordered from the Milwaukee company by the United Gas & Electric Co., 61 Broadway, New York City.

The past week in the machine tool market has been one of the most quiet periods in some time. Inquiries were small and scattered, and orders were relatively few. Pending settlement of the steel labor question and an improvement in foreign exchange rates, this situation is likely to continue, according to leading interests in the trade. The Baldwin Locomotive Works, Philadelphia, possibly the largest buyer of late, has completed its purchases, covering on approximately $100,000 worth of equipment.

While not so buoyant as they were last month, prices nevertheless, remain strong. The situation with regard to deliveries also is showing little change. Some of the heavier machines, such as large boring mills and planers, are holding around six to seven months; the lighter equipment, for the most part, is available for almost spot delivery.

On Oct. 2, bids will be opened at Washington on a quantity of miscellaneous machinery. This includes three chaser grinders; two power grindstone frames; 10 drill grinders; one heavy guide bar grinder; two nut-facing machines; 17 16-inch shapers; three cutting off machines; three hack saws; two millers; 11 drilling machines; one belt-lacing machine; five engine lathes; three pattern-makers' lathes; three turret lathes; one balancing machine; one steam hammer.

Crane Awards Heavy in Pittsburgh

SEVERAL crane inquiries which have been out in the Pittsburgh district for several weeks past recently, have been closed. The Pittsburgh Crucible Steel Co. has bought a 15-ton Morgan bucket crane while the four cranes inquired for in connection with the new plant of the Kelly-Springfield Tire Co. also have been placed, three small cranes going to the Shaw Electric Crane Co., Muskegon, Mich., and a large one to the Morgan Engineering Co., Alliance, O. The interstate Iron & Steel Co., Chicago, has ordered five Morgan cranes and the Slick-Knox Co. also has contracted for six Morgan cranes, four 15-ton and two wall cranes. The Erie Foundry Co., Erie, Pa., has closed for a 50-ton Champion crane with a 10-ton auxiliary. The Milwaukee Electric Crane Co. has taken a 4-motor, 34-foot span bucket crane from the West Penn Power Co.

The Carnegie Steel Co. has put out an inquiry for four 5-ton cranes with an alternative proposition for two 10-ton and two 5-ton cranes. Inquiry for a line of mill equipment is reported from a large French steel manufacturer making a substantial addition to his plant. Steady demand still is noted for machine tools and builders of a number of lines now are not promising deliveries short of eight weeks.

Cleveland Sellers Undisturbed by Strike

WHILE it is rather early for the sale of machine tools in Cleveland to be affected by the general iron and steel strike, dealers believe the trouble will be settled before this occurs. Business is in an extremely healthy condition; in fact sellers are at a loss to explain the reason for the sudden influx of inquiries and orders in view of the present unsettled labor situation. It is conceded, however, that considerably more business would be transacted if the labor trouble would subside. This recent activity is particularly true of heavy equipment, including cranes. Automobile plants, tractor manufacturers, oil well equipment builders, etc., are taking heavy planers, boring mills, etc. Sellers of cranes have all the business they can handle and inquiries are coming from all parts of the country. The McKinney Steel Co., Cleveland, recently purchased 20 and 40-ton electric cranes.

Two large machine tool inquiries are current in the Cleveland market, one from A. Bentley & Sons Co., Toledo, O., and the other from the Canadian Fairbanks Co., Ltd., Montreal. The former calls for 28 miscellaneous machines, including eight engine lathes, two each

American Exports of Machinery to Java Increase

AMERICAN trade in machine tools with the Netherland East Indies, beginning in 1902 with a valuation of but $20,000, increased in 1917 to more than $2,000,000, giving it leadership over all other countries.

The Netherland East Indies was a neutral territory during the war and the German name still carries a certain good will in engineering circles. The German firms in Java have not only kept their doors open and their organizations complete throughout the war, but they have been able to show a profit on the business done. British manufacturers are also well organized.

United States consular reports say:

The position now held by American manufacturers can be maintained if those interested will make a reasonable effort. As yet America has done very little work in the Java market, but Germany's record, in the accompanying table, shows what can be accomplished by good and persistent salesmanship. Active effort, with American methods, will show even better results, especially if started at once. American banks have opened branches in Java; American steamers now run direct and regularly. Conditions are right, and it seems probable that trade energy can be expended more profitably in the Netherlands East Indies than in many of the other markets of the world.

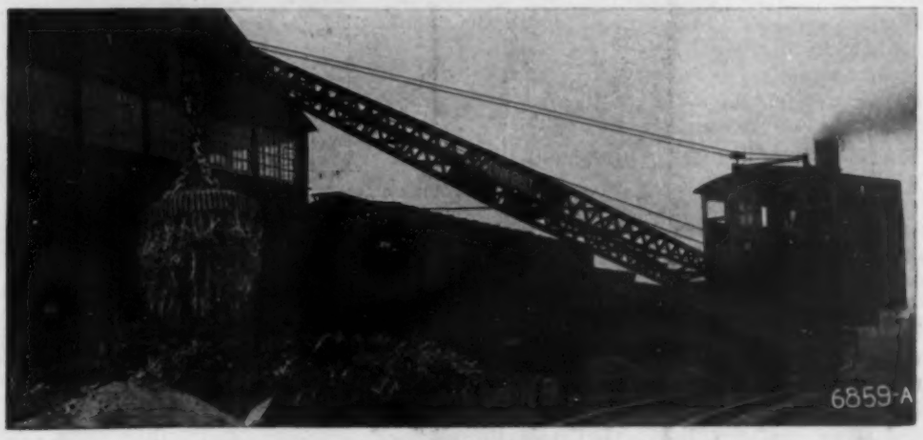
The table below gives the value of the total machinery imports and the share of this trade held by three principal exporting countries from 1900 to 1917, inclusive. Although these figures include the machinery imported into the whole archipelago, by far the greater part of this equipment went to Java:

Year	Great Britain	Germany	United States
1900	$ 901,686	$ 70,350	$ 20,100
1901	597,774	77,184	75,174
1902	309,138	147,534	29,346
1903	332,454	131,856	19,296
1904	387,528	147,131	38,592
1905	614,658	197,784	49,848
1906	509,334	438,582	45,828
1907	707,922	561,996	50,250
1908	1,033,542	526,620	46,632
1909	648,828	476,772	36,984
1910	817,668	736,062	85,224
1911	1,290,822	1,053,642	106,128
1912	2,191,704	1,511,520	122,610
1913	1,835,532	2,208,990	204,618
1914	1,973,418	1,849,916	295,068
1915	1,159,368	223,914	379,890
1916	1,568,604	26,934	1,165,800
1917	1,518,756	7,236	2,474,312

Handle It with a Crane

FOR handling heavy materials; for storing coal; for storing and rehandling anything, or switching cars, the Link-Belt Locomotive Crane is a useful and profitable machine around the yard. When not in use for the specific purposes for which it is purchased you will find there is always some other profitable work for such a machine to do. Write for Locomotive Crane Catalog No. 370.

And remember this, a Link-Belt Crane will be on the job every day—no layoffs, strikes, or demands for higher wages. Our Crane is "Built for Service", and you can always depend upon it.



TOP VIEW

Link-Belt Standard Steam Crane, 46-ft. Boom, 43-in. Magnet, 7½ K. W. Generating Outfit, handling scrap iron at the Alton Steel Co., Alton, Ill.

LOWER VIEW

Link-Belt 15-Ton, 42-foot Boom, Steam Locomotive Crane with Electric Magnet, handling billets, Dominion Foundries and Steel, Ltd., Hamilton, Ont., Can-

Let us send one of our Locomotive Crane engineers to help you with your handling problem.

LINK-BELT COMPANY

PHILADELPHIA CHICAGO INDIANAPOLIS

New York	299 Broadway
Boston	49 Federal St.
Pittsburgh	1801 Park Bldg.
St. Louis	Central Nat'l Bank Bldg.
Buffalo	547 Ellicott Square
Wilkes-Barre	3d Nat'l Bank Bldg.
Huntington, W. Va.	Robson-Prichard Bldg.
Cleveland	429 Rockefeller Bldg.
Detroit	932 Dime Bank Bldg.
Kansas City, Mo.	306 Elmhurst Bldg.
Seattle	576 First Ave., S.
Portland, Ore.	First and Stark Sts.
San Francisco	582 Market St.
Los Angeles	163 N. Los Angeles St.
Toronto, Can.	Canadian Link-Belt Co., Ltd.
Denver	Lindsoth, Shubart & Co., Boston Bldg.
Louisville, Ky.	Frederick Wehle, Starks Bldg.
New Orleans	C. O. Hinz, Hibernia Bank Bldg.
Birmingham, Ala.	S. L. Morrow, 700 Brown Marx Bldg.

(305)

We Also Make

- ☐ Elevators and Conveyors
- ☐ Link-Belt and Sprockets
- ☐ Silent Chain Drives
- ☐ Truck and Tractor Chains
- ☐ Electric Hoists
- ☐ Locomotive Cranes
- ☐ Wagon Loaders
- ☐ Coal and Ashes Systems

Write for Catalogs
Place X in Square

LINK-BELT
LOCOMOTIVE CRANES

turret lathes, radial drills, goose neck drills, sensitive drills, planers, shapers, horizontal boring mills; three v rtical boring mills, a milling machine, etc. The inquiry from the Canadian Fairbanks Co. is for shipment to Vancouver and specifies, one double end punch and shear, shear to have 36-inch throat, punch to have 36-inch throat to punch 1¼-inch holes in 1-inch plate; one angle iron bending machine for bending 4 x 4-inch angles; one bull dozer to bend I-beams up to 15 inches; one 1500-pound steam hammer; one gear cutting machine capable of cutting 36-inch spur gears, 2-inch circular pitch, also to cut bevel gears up to 36 inches in diameter; one horizontal boring mill, capable of boring to the center of a 102-inch circle; one gear cutting machine, suitable for cutting 36-inch spur gears, 2-inch circular pitch, also for cutting 36-inch bevel gears, 2-inch circular pitch; one 42-inch open side planer, 12-foot bed; one angle iron bender for 4 x 4-inch angles or channel irons; one double end punch and shear, to shear 1-inch plate, shear t› have 36-inch throat, punch to have 36-inch throat capable of punching 1½ or 1¼-inch hole in 1-inch plate; one 1500-pound crosshead type steam hammer; one 36-inch triple geared lathe, 14 feet between centers; one 4 or 5-foot radial drill, either full universal or with universal box type table; one 3-inch bolt threader; one bull dozer, suitable for bending and straightening I-beams up to 15 inches.

A heavy demand is noted from automobile manufacturers. Among the equipment wanted by the Holmes Automobile Co., Canton, O., is some tapping machines. The F. B. Stearns Co., Cleveland, desires to obtain some automatic screw machines. The Templar Motors Corp., Cleveland, and the Peerless Motor Car Co., that city, also are understood to be in the market for some equipment. The Dort Motor Car Co., Flint, Mich., is preparing for expansion and has issued some tentative inquiries for equipment. The Hudson Motor Car Co., Detroit, and other Michigan automobile companies are in the market. The Columbia Axle Co., Cleveland, is still in the market for Warner & Swasey screw machines, tapping machines, drills, etc.

Other smaller inquiries are received from various industries. The Broadfoot Iron Works Co., Wilmington, N. C., wants a lathe, a milling machine, a key-seating machine and some other equipment. The Apex Electrical Mfg. Co., Cleveland, wants two grinders, a bandsaw, etc. The Ohio Blower Co., Cleveland, wants a 48-inch power square shear. Wilcox, Lynn & Co., Ravenna, O., machinists, want a 20 to 24-inch lathe. The United States Tire Co. and the Cleveland Osborne Mfg. Co., Inc., both of Cleveland, are in the market for some miscellaneous equipment. The Electric Vacuum Cleaner Co., also of Cleveland, has purchased a semi-automatic Frazer grinder, increasing the hourly production on a small grinding job from 40 to 1500. The Kilby Mfg. Co., Cleveland, wants a 12-foot boring mill, taking 7 feet or more under crossrail. The Aetna Brass Mfg. Co. Cleveland, still is advertising for used polishing lathes, and the Manitowoc Shipbuilding Co., Manitowoc, Wis., is asking for a heavy gate shear or Bliss type, doubled geared, double crank, press ram pressure capacity 600,000 pounds, 84 inches between housings.

Prices remain firm at recent advances. In some cases they now are within 12½ per cent of the highest prices asked during the war.

Chicago Buyers Take Light Equipment

MOST buying of machine tool equipment in the Chicago market at present is of light machinery rather than heavier types. In the experience of some dealers there is a special demand for millers and it is now difficult to place orders for reasonable delivery for the No. 2 size. This demand indicates renewed activity in small machine shops, as millers usually are bought after lathes and other primary equipment has been installed and business enlarges. This also fits into the situation which has continued over several months, buying of single tools rather than complete equipment.

Considerable demand is noted for tools to be used by manufacturers of heavier types of tractors and by refrigerating machinery manufacturers especially.

Deliveries are becoming more delayed, and 60 to 90 days is about the average. All prices which had been reduced since the first of the year have gone back to their former level and any tendency toward a change seems to be upward rather than downward. The Moline Plow Co. has not yet made inquiry for equipment for its general machine shop recently burned, and, as indicated last week, it is understood this machinery will be bought from government stocks. Montgomery, Ward & Co., who are building an engine manufacturing plant at Springfield, Ill., complete from foundry to paint shop, continues to place orders for the necessary equipment.

Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

PORTLAND, ME.—The Arkin Fastener Co. has been incorporated with $60,000 capital by William Shepherd Linnell, B. L. Merryman and William M. Bradley.

PORTLAND, ME.—The Theatric Welding Co. of America, Inc., has been incorporated with $75,000 capital by James M. Graham, Charles M. Parker and Lewis G. Parker.

PORTLAND, ME.—The East Coast Fisheries Products Co. has been incorporated to build vessels and boats with $50,000,000 capital by Frank I. Cowan, H. W. Baston and Clement F. Robinson.

BOSTON.—The S. A. Woods Machine Co. plans a plant, 3-stories, 70 x 250 feet, to cost about $90,000.

BOSTON.—The S. M. S. Co. has been incorporated to manufacture machinery, motor vehicles, tires, etc., with $45,000 capital by Thomas J. Sullivan, Arthur M. Marston and Lewis W. Skillings.

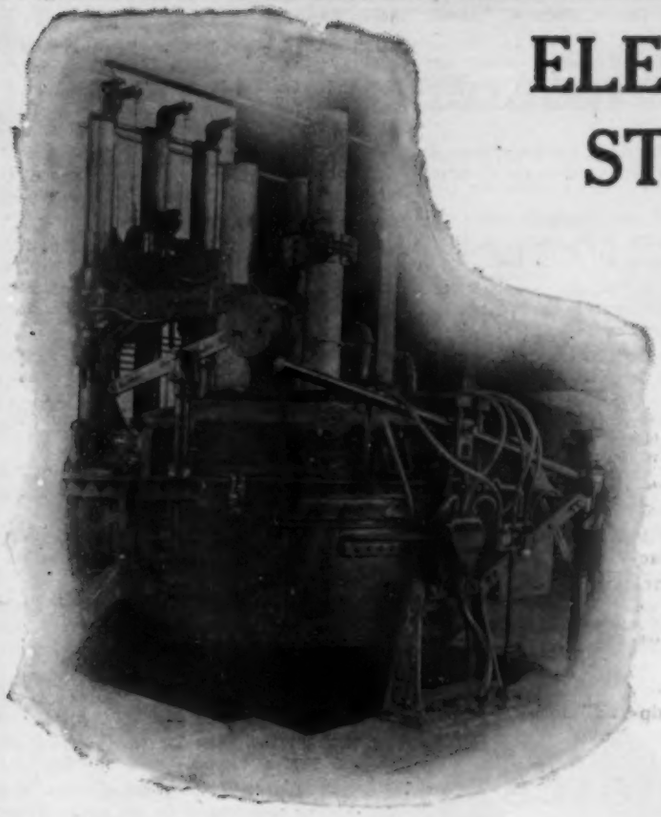
BOSTON.—The R. L. Harper Co. has been incorporated to manufacture engines, motors, machines, etc., with $50,000 capital by Robert Lee Harper, Robert C. McGowan, and Henry D. Nunn.

CAMBRIDGE, MASS.—The Cambridge Machine & Tool Co. has been incorporated with $35,000 capital by Antonio Marciano, Vinent Popoli and Huran H. Seron.

EVERETT, MASS.—The Beacon Oil Co. will build

FARRELL-CHEEK

ELECTRIC FURNACE STEEL CASTINGS



Every electric furnace steel casting made in our foundry is carefully nursed from the day it enters as an order until it is ready for the final, critical examination. The same master workmen, who made the enviable reputation of the Farrell-Cheek Foundry, are now turning out superior electric furnace steel castings.

And so it is easy to understand why Farrell-Cheek electric furnace steel castings make good. They ***are*** better. The metal is right to start with, and every operation in the making is scrutinously watched to ensure the maintaining of the high standard which characterizes all Farrell-Cheek Castings.

Your work is completed and delivered quickly. Give this exceptional service your consideration, too.

Write!

FARRELL-CHEEK STEEL FOUNDRY CO.

"Makers of steel castings that are a little better than the next best."

Sandusky, Ohio

a 1-story, 36 x 90-foot machine shop, 53 x 108-foot boiler house and a 30 x 95-foot storehouse to cost $70,000.

FALL RIVER, MASS.—The New England Oil & Refining Co. has let the contract for a $500,000 plant to include seven steel tanks.

LOWELL, MASS.—Knowlton & Newton Co., Inc., has been incorporated to do a general sheet metal business with $20,000 capital by Harry W. Knowlton, Joseph N. Leonard, Lexington, Mass., and Wilmer A. Newton.

LYNN, MASS.—The Hancock Perfecting Lineup Machine Co. has let the contract for a 1-story, 48 x 128-foot factory.

NORTHAMPTON, MASS.—C. A. Maynard, Green street, manufacturer of garden tools, plans to rebuild his forging shop which was recently damaged by fire.

NORWOOD, MASS.—A Hershenson & Co., Inc., has been incorporated to deal in iron, metals, etc., with $3000 capital by Alek Hershenson, M. Hershenson and Jacob Miller.

SPRINGFIELD, MASS.—The Duckworth Chain & Mfg. Co. contemplates a plant, 1-story, 50 x 120 feet.

SPRINGFIELD, MASS.—The Forging Service Co. has been incorporated with $25,000 capital, by J. Howard Jones, N. C. French and Walter H. McCarthy.

SPRINGFIELD, MASS.—Bids have closed for a 4-story and basement, 50 x 101-foot addition to the factory of the Bemis & Call Hardware & Tool Co., maker of wrenches, to cost $45,000.

WATERTOWN, MASS.—Bids closed Sept. 22 for a machine shop, 42 x 362 feet, at the United States arsenal.

WALTHAM, MASS.—W. H. Nichols has let the contract for a 80 x 150-foot machine shop to cost $25,000.

WOLLASTON, MASS.—Bids closed Sept. 24 for the erection of a plant for the Tubular Rivet & Stud Co.

WORCESTER, MASS.—The Worcester Pressed Aluminum Co. has been incorporated with $150,000 capital by Cornelius A. Brosnan, Edwin W. Whitmore and A. E. McGrath.

PROVIDENCE, R. I.—The American Boiler Tube Thimble Co., 95 Orms street, has been organized to manufacture metal products, by John F. McKenna and others.

BRIDGEPORT, CONN.—The American Tube & Stamping Co. has plans for alterations and extensions to its plant.

BRIDGEPORT, CONN.—The Perfection Shear Co. has been incorporated with $5000 capital by E. F. Von Wettberg, G. P. Brett Jr. and A. Dunn.

DANBURY, CONN.—A $55,000 machine shop, 1-story, 90 x 200 feet, will be erected here by Doram Bros., hatters' machinery.

ELMWOOD, CONN.—The Whitlock Coil Pipe Co. has awarded a contract for a 1-story machine shop, 48 x 71 feet.

NEW BRITAIN, CONN.—The Trumbull Electric Co. contemplates a plant addition, 4-stories, 50 x 106 feet.

NEW HAVEN, CONN.—The American Radiator Co. has awarded a contract for a 2-story building, 100 x 135 feet, to cost about $85,000.

WATERBURY, CONN.—Plans have been completed for a $60,000 plant, 50 x 120 feet, for the Manufacturers Foundry Co.

WINSTED, CONN.—Plans are being prepared by the Fitzgerald Mfg. Co. for a plant to manufacture automobile accessories.

North Atlantic States

BROOKLYN, N. Y.—Barber & Co., 17 Battery place, is having plans drawn for a machine shop, 1-story, 100 x 100 feet, to cost $50,000.

BROOKLYN, N. Y.—The Columbia Tinware Co. has been incorporated with $20,000 capital, by J. Levitt, J. Menoff and S. Antoville, 351 East Forty-ninth street.

BROOKLYN, N. Y.—Laverne C. Brown, Inc., boats and cras, recently was incorporated with $50,000 capital, by J. P. Moran, L. C. and A. L. Brown, Hotel Commodore.

BROOKLYN, N. Y.—The Kenmore Sheet Metal Works, Inc., has been incorporated with $5000 capital, by M. and R. and M. L. Krissberg, 1079 Coney Island avenue.

BUFFALO.—The Federal Metal Hose Corp. has been incorporated with $78,750 active capital, by C. G. Baysar, I. W. Smith and C. Palmer.

BUFFALO.—The Buffalo Nipple & Machine Co. is arranging to build a factory in this city to cost $10,000.

BUFFALO.—The National Plyer Co., Inc., hardware specialties, has been incorporated with $25,000 capital, by K. B. MacDonald, 34 Penhurst Park, W. R. Daniels, 903 D. S. Morgan building, and others.

ELMIRA, N. Y.—This city is considering a bond issue of $5,000,000 for an extension to its waterworks plant.

JAMESTOWN, N. Y.—The Mobilex Accessory Co., auto accessories, has been incorporated with $25,000 capital, by A. Wedeborg, A. E. Tunberg and W. E. Tiffany.

JAMESTOWN, N. Y.—The Chautauqua Electric Power Co., capital $750,000, will remodel the plant of the Supreme Furniture Co. at Falconer, N. Y., to make electric cars. Address E. J. McGee, of this city.

LOCKPORT, N. Y.—The Lockport Auto Radiator Corp. has been incorporated with $30,000 capital, by J. L. Branch, C. D. Nye and F. M. Capell.

NEW BALTIMORE, N. Y.—The New Baltimore Shipbuilding & Repair Corp. has been incorporated with $45,000 capital by W. W. Stebbins, W. J. Wade and R. B. Drew, 507 Henry street, Brooklyn, N. Y.

NEW YORK.—The National Auto Accessories Co. has been incorporated with $25,000 capital, by H. and M. and L. Epstein, 127 West 112th street.

NEW YORK.—The Feridus Machinery Co. has been incorporated with $10,000 capital by S. E. and B. Aaron and B. Salinsky, 31 Essex street.

NEW YORK.—Charles Cory & Son, 290 Hudson street, nautical instruments, has plans for a 6-story plant, 76 x 150 feet, to cost $185,000.

NEW YORK.—The Adeco Industrial Co., engines, etc., has been organized by Albert West and Frederick Cardway, New Rochelle, N. Y.

NEW YORK.—The Wilson-Maculen Co., 781 East 142nd street, pyrometers, etc., is having plans prepared for a 3-story addition, 50 x 100 feet.

NEW YORK.—The New York Wire Cloth Co., 233 Broadway, is taking bids for a 2-story addition, 45 x 80 feet, to cost about $30,000.

NEW YORK.—The Monofer Shipbuilding Co. has been incorporated with $30,000 active capital, by L. F. Sniffin, J. L. Druck and F. Kweton, 49 Wall street.

NEW YORK.—The Acme Furnace Equipment Co. has been incorporated with $21,000 capital, by E. W. Sturart, R. W. Owens and F. M. Clute, 100 Broadway.

NEW YORK.—The Raymond Mfg. Co., machine shop and foundry supplies, has been incorporated with $150,000 capital, by H. O. Zurich, 5 Wilson court, Ocean Parkway, M. Sonken, 178 DeKalb avenue, Brooklyn, N. Y., and M. Cohen, 1226 Boston road.

NEW YORK.—The Supreme Metal Products & Refining Works, Inc., welders, toolmakers, etc., has been incorporated with $30,000 capital, by M. Berinkow, 94 Wilson street, Brooklyn, N. Y., B. Bernstein, and R. Bernstein, 522 West 136th street, New York.

NIAGARA FALLS, N. Y.—The Carborundum Co., Buffalo avenue, has had plans prepared for a 3-story addition, 99 x 224 feet, to cost $150,000.

NORTH PELHAM, N. Y.—The American Tekeng Products Co., boiler metal preserving materials, has been incorporated with $35,000 capital, by J. Meyer, C. Adams and L. M. Moehler, 1 Madison avenue.

ROCHESTER, N. Y.—The Francis Metal Door & Window Corp. has been incorporated with $25,000 capital, by A. W. and I. M. and G. D. Francis.

ROCHESTER, N. Y.—The North East Electric Co. 348 Whitney street, has let the contract for an addition, 76 x 140 feet, to cost $60,000.

UTICA, N. Y.—The Utica Heater Co. has awarded contracts for three additions, to cost about $20,000.

BEAVER FALLS, PA.—The Keystone Driller Co. is having plans prepared for a 2-story plant 40 x 60 feet.

BOYERSTOWN, PA.—The Boyerstown Brass Foundry Co. has been incorporated with $50,000 capital, by W. M. Johnson, A. R. May and Garrett J. Heaves.

CARBONDALE, PA.—The Carbondale Machine Co. has awarded a contract for a machine shop, 1-story, 20 x 220 feet, to cost about $60,000.

CONNELLSVILLE, PA.—The Sligo Iron & Steel Co. will build a warehouse 60 x 270 feet.

CORAOPOLIS, PA.—The Standard Steel Spring Co. is having plans prepared for two 1-story buildings.

ELLWOOD CITY, PA.—This city is considering the erection of a municipal garbage disposal plant.

ERIE, PA.—The Westcott Valve Co. has plans for a plant at Seneca Falls, N. Y., to cost $25,000.

ERIE, PA.—The board of water commissioners will build a 15,000,000-gallon reservoir.

ERIE, PA.—The Rickart-Shafer Co., machine tools, plans a new plant, 50 x 152 feet.

FLEETWOOD, PA.—The Cambria Car & Foundry Co. has been incorporated with $50,000 capital, by William J. Thiele, Herman J. Widmar and J. M. Gastmann.

LANCASTER, PA.—The E. T. Fraim Lock Co. is having plans drawn for a machine shop, 1-story, 44 x 82 feet.

MONACA, PA.—This city is considering plans by Elmer E. Sproul for a waterworks plant.

PHILADELPHIA.—Contracts for a machine shop addition, to cost $13,000, have been awarded by the Robert E. Lamb Co.

PHILADELPHIA.—Property has been purchased by the Wicaco Screw & Machine Works, Inc., for a $100,000 plant.

PHILADELPHIA.—Contract for a $35,000 machine shop and laboratory for the Sharples Specialty Co. has been awarded. The building will be 1-story, 75 x 104 feet.

PHILADELPHIA.—The Atwater Kent Mfg. Co., mechanical and electrical equipment, has been incorporated with $5000 capital, by Atwater Kent, Ardmore, Pa., W. J. Little and Paxson Deiter.

PHILADELPHIA.—The Philadelphia Metal Lathing & Furring Co. has been incorporated to manufacture metal lathing with $5000 capital, by M. H. Jester, 102 North Dewet street, John J. Bauer, 2139 North Twelfth street, and others.

PITTSBURGH.—The Pittsburgh Valve Foundry & Construction Co., Twenty-sixth street and the Alle-

FOR ECONOMY OF SPACE AND POWER

—are you wasting either?

When you figure on big reductions with a train of spur gears be sure to take into consideration the wastage of space and power. Herringbone Gears make direct reductions as high as 20 to 1, thereby saving space and power losses.

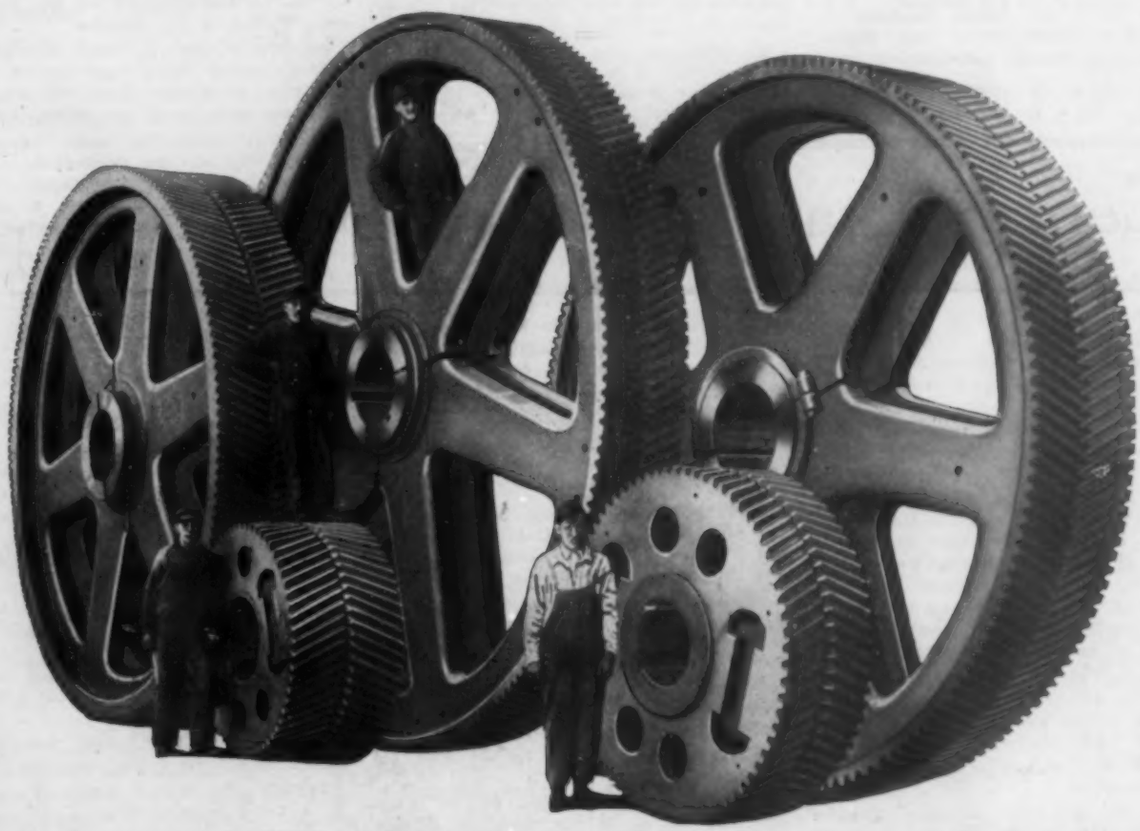
This type of gear has many other advantages: The action is continuous and smooth; there is no shock of transference from tooth to tooth; the teeth do not wear out of shape; the bending action of the load on the teeth is less than with straight gearing; "back-lash" is entirely absent; friction and mechanical losses are reduced to a minimum; herringbone gears can be used at greater velocities than any other kind.

Herringbone Gears are hobbed from the solid by means of special machinery to get precision heretofore not attained in gear cutting. They are far more efficient than belts, ropes, worm gears or compound trains of spur gears. They are particularly quiet in action and cause practically no vibration—two big advantages which are lacking in spur gears.

Our descriptive booklet contains much valuable information concerning gears and gearing problems. Send for it today.

The Falk Company, Milwaukee, Wis.

AGENTS: Pittsburgh—W. O. Beyer, 1024 Park Bldg. New York—M. P. Fillingham, 50 Church St. Wilkes-Barre—Vulcan Iron Works. Denver—Denver Engineering Works. San Francisco—F. W. Grimwood, Rialto Bldg.



FALK HERRINGBONE GEARS

gheny Valley railroad, has completed plans for a 1-story plant addition.

PITTSBURGH.—The Oliver & Snyder Steel Co. contemplates a boiler house, 1-story, 44 x 64 feet.

PITTSBURGH.—The Union Steel Casting Co. will build a plant shortly at 6100 Butler street to cost $37,000.

SHARON, PA.—Frank Taylor & Son, of this place, have the plans for the iron works for A. N. and Louis Rosenblum.

WILKES-BARRE, PA.—The Guarantee Silk Corp. is taking bids for a power plant here.

WILKES-BARRE, PA.—The Wilkes-Barre Iron & Wire Works Co. has been incorporated with $10,000 capital, by Hugh P. Watters, Scranton, Pa., and others.

RAHWAY, N. J.—The Superior Body Co. has been incorporated with $500,000 capital, by Joseph Axman, Thomas Armstrong and David Armstrong.

JERSEY CITY, N. J.—The Marion Mfg., iron and steel, has been incorporated with $100,000 capital. The company has an office at 665 Newark avenue.

NEWARK, N. J.—The Prest-O-Lite Co. has let a contract for two factory buildings.

NEWARK, N. J.—Plans are being prepared by the Irving Mfg. Co. for an extension, 3-stories, 50 x 50 feet.

NEWARK, N. J.—The Atlantic Smelting & Refining Co. has let a contract for a factory building to cost $100,000.

NEWARK, N. J.—The Newark Auto Body & Repair Co., Newark street, has been incorporated by Thomas J. Gorman and others.

NEWARK, N. J.—The American Transformer Co. has awarded a contract for a plant addition, 1-story, 11 x 67 feet.

NEWARK, N. J.—The American Platinum Co., Oliver street and New Jersey Railroad avenue, will erect a 3-story, 50 x 132-foot plant and a boiler house, 1-story, 25 x 42 feet.

NEWARK, N. J.—Work has been started on a $110,000 garage and sales building for the Franklin Motor Car Co. The building will be 3-stories and one of the floors will be devoted to repair and assembly work.

NEWARK, N. J.—The Witteman-Lewis Aircraft Co. has begun work on a plant. Three buildings are under construction. The main building, one of two stories is 165 x 200 feet, will be used for a construction and assembling room. Another building is be devoted to engine testing, and will also contain the boiler and engine equipment.

BALTIMORE.—The Baltimore Spring Works, 118 Dauphin street, will build a 3-story addition.

BALTIMORE.—The Baltimore Water & Electric Co. has let the contract for a pump house to cost $15,000.

BALTIMORE.—Hill & Ferguson, 112 East 19th street, New York, will prepare plans for a waterworks plant in this city.

BALTIMORE.—The Federal Mfg. Co., aluminum solder, has been incorporated by James T. Carter, 900 Maryland Trust building, and others.

BALTIMORE.—The Baltimore Tube Co. has awarded a contract for a milling shop, 1-story, 75 x 144 feet, to cost about $25,000.

BALTIMORE.—The Boyden Co-Ordinating Car Corp., Keyser building, has been organized by George Boyden and others. The company is reported planning to build plants in various parts of the country for the manufacture of car trucks.

NORFOLK, VA.—The Western Electric Co. is planning to erect a branch plant here.

NORFOLK, VA.—The Norfolk Metal Plating & Galvanizing Co. has been incorporated with $10,000 capital, by R. E. Pelot, A. G. Ellis and others.

RICHMOND, VA.—The American Can Co. is reported planning to improve its plant here at an estimated cost of $10,000.

Central States Activity

CHIPPEWA FALLS, WIS.—G. W. Johnson, former superintendent of the Chippewa Foundry & Machine Co., is organizing a new corporation for the manufacture of a pumping engine. A machine shop is now being erected.

FOND DU LAC, WIS.—The Vulcan Mfg. Co. is having plans prepared for a 1-story shop addition, 40 x 150 feet, to cost $20,000 and will buy new equipment costing $15,000.

HARTFORD, WIS.—The Ideal Mfg. Co., medical instruments, has purchased the Hahn building, and will move its plant after remodeling work is completed.

JANESVILLE, WIS.—Bids are being taken by the board of education, S. C. Burnham, secretary, for the erection of a new high school estimated to cost $250,000. A boiler house is included in the plans.

KENOSHA, WIS.—The Chicago & Northwestern railroad has approved plans for a $300,000 bridge.

KENOSHA, WIS.—The Winther Motor Truck Co. is planning plant additions and the purchase of some new equipment.

KEWASKUM, WIS.—The Kewaskum Aluminum Mfg. Co. has been organized with $150,000 capital and will erect a 3-story plant at an estimated cost of $50,000.

MILWAUKEE.—The Western Machine Co., which recently increased its capital, will enlarge its facilities.

MILWAUKEE.—The Harley-Davidson Motor Co. will enlarge its main plant by a 5-story addition, 120 x 215 feet, to cost with machinery $350,000.

MILWAUKEE.—The Milwaukee Tank Works, 851 Kinnickinnic avenue, has let contracts for a 1-story warehouse, 80 x 100 feet.

MILWAUKEE.—Bliss Bros. Tool Co., 62 Mason street, has increased its capital stock from $15,000 to $40,000. The output of tools, dies, jigs and fixtures is being increased.

MILWAUKEE.—The Perfection Bottle Cap Co. has been organized with $100,000 capital, by Carl J. Shuster, August C. Barthmann and Louis E. Will, to manufacture metal caps for bottles, etc.

MILWAUKEE.—Articles of incorporation have been filed by the Machine Products Co., with $10,000 capital. The incorporators are Jay J. Van Vechten, Robert A. Radwick and Oliver W. Bow.

MILWAUKEE.—The Nash Motors Co., Kenosha, Wis., plans the first unit of its new plant. The building will be 200 x 600 feet. It is expected contracts will be let shortly for the power and boiler house.

MILWAUKEE.—The James Mfg. Co., Ft. Atkinson, Wis., will ask for bids shortly for an addition, 400 x 600 feet. Complete foundry equipment, including cranes, conveyors, etc., will be purchased. J. G. Shodron is superintendent.

MILWAUKEE.—The American Electric Motor Co., capitalized at $175,000, has been chartered to manufacture electric motors and other devices by Walter N. Sprinkmann, Harry B. Mortimer and Carl M. Daum.

MILWAUKEE.—The Koehring Machine Co., manufacturer of concrete mixers, will build an erecting shop and office building three stories, 73 x 327 feet, and an addition to its machine shop, 60 x 118 feet, costing $107,000.

MILWAUKEE.—The Lewis Steel Products Co., Toledo, O., has engaged Architect Alfred C. Clas, Colby & Abbot building, to prepare plans for a foundry and machine shop addition, 150 x 360 feet, estimated to cost about $350,000.

MILWAUKEE.—The American Electric Motors Co. of Milwaukee, has been incorporated with a capital stock of $175,000 by Walter N. Sprinkmann, Harry B. Mortimer and Carl L. Daum to manufacture electric motors, motor-driven appliances and devices, etc.

MILWAUKEE.—A training building for apprentices will be erected in connection with the Milwaukee harvester works of the International Harvester Co. at an estimated cost of $35,000. The building will be 120 x 125 feet, one story high.

OSHKOSH, WIS.—The Oshkosh Motor Truck Co. has acquired a tract for its proposed machine shop and assembling floor, to be 150 x 300 feet.

OSHKOSH, WIS.—The Bull Dog Tractor Co., A. H. Gruenwald, manager, 24 Washington street, will build a plant 200 x 200 feet, costing $750,000.

PORTAGE, WIS.—The Slinger Foundry & Machine Co. is contemplating a large addition and plans to build the foundations before winter, completing the structure early in the spring. H. W. Slinger is manager.

PORT WASHINGTON, WIS.—The Gilson Mfg. Co. has awarded contracts for a foundry and machine shop addition, 60 x 160 feet, to cost $45,000. Harry W. Bolens is president.

SCHLEISINGERVILLE, WIS.—The general contract for erecting a 1-story shop addition, 60 x 200 feet, for the Vim Tractor Co. has been awarded to Walter Tuckwell & Co., Milwaukee.

SHEBOYGAN, WIS.—The Wald Mfg. Co., will build an addition costing about $45,000 for the manufacture of automobile parts. The company recently increased its capital from $30,000 to $90,000.

SHEBOYGAN, WIS.—The foundry department of the Globe Co. has been organized as a separate corporation known as the Globe Foundry Co., with $100,000 capital, and will erect a gray iron foundry, and the present foundry utilized as a machine shop when it is completed.

TOMAH, WIS.—The board of education was authorized at a special election to spend $75,000 on a 3-story addition, 50 x 75 feet, to the high school, to contain manual training department, and a central heating plant.

TWO RIVERS, WIS.—The Suettinger Sheet Metal Works is arranging to take additional space and will purchase some new machinery.

TWO RIVERS, WIS.—A $25,000 factory addition is planned by the Wisconsin Textile Mfg. Co., which makes metal and wood supplies and appliances for textile mills. O. B. Alberts is secretary.

ALBION, MICH.—The Albion Bolt Co. has acquired the plant of the Albion Chemical Works.

ALMA, MICH.—The Northern Wheel Co., capitalized at $1,000,000, has been chartered to manufacture wheels by A. D. Smith president and Orville Allen secretary.

BAY CITY, MICH.—The Union Motor Truck Co. has awarded contracts for a plant, 100 x 500 feet, and a foundry, 60 x 120 feet.

DETROIT.—The Detroit Twist Drill Co. has awarded contracts for a plant addition.

DETROIT.—The Michigan Machine Co. has plans for a 3-story factory building.

DETROIT.—The Stroh Castings Co. is having plans prepared for a 3-story factory building.

DETROIT.—The Riverside Machinery Depot has let contracts for a factory addition.

DETROIT.—The Arthur Colton Co. has let contracts for a blacksmith shop and factory addition.

DETROIT.—The United Grinding Co. has been incorporated with $25,000 capital, to manufacture

automobile cylinders and crank shafts, by J. K. Lawrence, 1240 Jefferson avenue and others.

HAMMOND, IND.—Fire damaged the plant of the General American Tank Corp. at East Chicago, Ill. The damaged buildings include the brass foundry, car shop and insulating shop. The damage has been estimated at $300,000.

CHICAGO.—The American Insulated Wire & Cable Co. is taking bids for remodeling its plant.

CHICAGO.—The Hill Pump & Valve Co. has taken out a permit to erect a plant at an estimated cost of $150,000.

CHICAGO.—The Strandberg Bros. Co., 10 South La Salle street, will build a two and 3-story factory, 40 x 162 feet, costing $40,000.

CHICAGO.—The Cribbes & Sexton, 6630 North Sacramento avenue, has awarded contracts for an enameling plant, 1-story, 100 x 130 feet.

CHICAGO.—The Arthur Jones Electric Co., Arthur Jones, president, electrical equipment, 2837 South State street, will build a one and 2-story factory, 125 x 125 feet, costing $60,000.

CHICAGO.—Frank D. Chase, Inc., engineer, 645 North Michigan avenue, is drawing plans for a foundry addition, for the Ohio Steel Foundry, Lima, O.

CHICAGO.—The Maytag Co., 211 West Fourth street, Newton, Iowa, is having plans prepared by Architect Henry Raeder, this city, for a foundry, to cost $70,000.

CANTON, O.—The Interestate Aluminum Co. has been incorporated with $25,000 capital, by T. M. Dubbs, J. W. Fenstermaker and others.

CINCINNATI.—The Doran Bros. Electric Co. is taking bids for a plant, 2-stories, 40 x 100 feet, to cost $20,000.

CINCINNATI.—The E. H. Bardes Range & Foundry Co. is having plans drawn for a foundry addition, 100 x 100 feet, to cost $17,000.

CLEVELAND.—The F. P. Screw Co., 2279 East Seventy-seventh street, has awarded a contract for a plant, 1-story, 60 x 150 feet, to cost $40,000.

CLEVELAND.—The Lake Erie Steel & Wire Co., Bedford, O., has been incorporated, by George Keeley, Society for Savings building, and others.

CLEVELAND.—The Torbensen Axle Co. is having plans prepared for an addition to provide about 15,000 square feet of floor space.

CLEVELAND.—The K. & W. Iron Construction Co. has been incorporated with $10,000 capital, by Arnold L. Stern, L. H. Wilk and others.

CLEVELAND.—The Commercial Steel & Supply Co. has been incorporated with $100,000 capital, by A. A. Murfey, W. H. Dickey, Clinton DeWitt, Charles D. Simmons and C. B. Bayly.

CLEVELAND.—The Factory Tool & Supply Co. has been incorporated with $10,000 capital, by Arthur F. Schefft, Paul J. Weber, S. M. Schefft, P. R. Weber and Walter N. Hoppe.

CLEVELAND.—The Tool & Auto Products Co. has been incorporated with $75,000 capital, by J. D. Wiggins, Frank Chesky, L. S. Greenmun, F. W. Bachman and Fred Kramme.

CLEVELAND.—The Keystone Bolt & Nut Co. recently was incorporated with $10,000 capital, by M. E. Krejci, A. Krejci, Michael Trautman and others.

ELYRIA, O.—The plant of the Elyria Iron & Steel Co. recently was damaged by fire.

TOLEDO, O.—Erection of a foundry, 153 x 378 feet, boiler house, 40 x 50 feet, power house and engine room, 30 x 200 feet, and other buildings, are planned by the Toledo Machine & Tool Co. Contracts for the buildings have been let. Charles W. Greening is secretary of the company.

WARREN, O.—The Industrial Welding Process Co. has been chartered with $5000 capital, by Edwin J. Henke, Fred P. McBerty, Ebba V. Henke and others.

DAYTON, KY.—The Wadsworth Watch Case Co. plans an addition estimated to cost $20,000.

HARLAN, KY.—The Bowen Mfg. Co., rail clamps, has been organized with $12,000 capital, by M. I. Bowen, Arthur Thompson and others.

LOUISVILLE, KY.—The Dow Wire & Iron Co. has awarded a contract for a plant.

LOUISVILLE, KY.—Greathouse Bros. & Co. recently were incorporated with $4000 capital, to engage in the manufacture of sheet metal equipment.

LOUISVILLE, KY.—The Ovee Mfg. Co. has purchased a site on which it will build a plant addition for the manufacture of automobile supplies, at an estimated cost of $50,000.

LOUISVILLE, KY.—The Riddell Mfg. Co., sheet metalworking, has been purchased by J. W. and D. C. DeHart. The company specializes in galvanized iron equipment.

LOUISVILLE, KY.—The Byron Engineering Works, C. E. Byron, J. S. Johnson and others, is planning to install a plant for the manufacture of automobile trailers.

PADUCAH, KY.—The Alamo Machinery Co. has been incorporated with $10,000 capital by W. J. Pierce and others.

CHARLESTON, W. VA.—The Kanawha & Hocking Coal & Coke Co. will build a tipple and make other improvements.

CHARLESTON, W. VA.—The Kallmerten-Warner Electric Co. has been incorporated with $10,000 capital, by G. E. Warner and others.

CLARKSBURG, W. VA.—The West Virginia Metallic Railway Tie Co. has been incorporated with $25,000 capital, by Joseph Marra and others.

FAIRMONT, W. VA.—Mayor J. M. Boyle announces that bids will be taken for the erection of a brass mill here.

FAIRMONT, W. VA.—The West Virginia Metal Products Co., capital $2,500,000, will build a plant here to cost $1,500,000.

HUNTINGTON, W. VA.—The Ohio Valley Mine Car Mfg. Co. will build a plant 90 x 150 feet.

MOUNDSVILLE, W. VA.—The United States Stamping Co. has let the contract for an addition.

MOUNDSVILLE, W. VA.—The Cameron Tool Co. has let the contract for an addition.

NEW CUMBERLAND, W. VA.—The West Virginia-Pittsburgh Coal Co. will build a power plant here to cost $100,000.

PARKERSBURG, W. VA.—The Donovan Boiler Works has started work on a plant.

PARKERSBURG, W. VA.—The Baldwin Tool Works has let the contract for a factory, 40 x 130 feet.

WELLSBURG, W. VA.—The Wellsburg Light & Power Co. will rebuild its plant here to cost $100,000.

WHEELING, W. VA.—The J. E. Moss Iron Works will build a plant, 125 x 250 feet.

WHEELING, W. VA.—The Wheeling Stamping Co. is arranging to build a plant in this city to cost $30,000.

Business in Canada

WINNIPEG, MAN.—The Twin City Separator Co. has started work on a 3-story machine shop and warehouse to cost $75,000.

LOUISBURG, N. S.—The Louisburg Drydock & Shipbuilding Co. will start early in 1920 on a drydock here to cost about $5,000,000, according to J. W. Maddin one of the company incorporators.

SYDNEY MINES, N. S.—The Nova Scotia Steel & Coal Co., New Glasgow, N. S., will erect a by-products plant here.

COWANSVILLE, QUE.—The Colonial Machinery Co. has been incorporated to manufacture machinery, tools, iron, steel, etc., with $50,000 capital by Harry R. Fraser, Frederick S. Rugg, Charles de L. Mignault all of Sherbrooke, Que., and others.

LONGUE POINT, QUE.—The Montreal Locomotive Works, Ltd., 145 St. James street, Montreal, has awarded contracts for five factories here to cost $212,000.

BRIDGEBURG, ONT.—The King Separator Works, Ltd., has been incorporated to manufacture cream separators, etc., with $50,000 capital by Edward H. Neelon, George F. Peterson, Frank N. Bitherford and others.

CHATHAM, ONT.—The springs building of the Dowsley Spring & Axle Co. recently was damaged by fire, with a loss estimated at $50,000.

HAMILTON, ONT.—The Dominion Sheet Metal Co., 1322 Burlington street, has let the general contract to W. H. Cooper, Clyde building, for a $25,000 addition.

HAMILTON, ONT.—The Frost Steel & Wire Co., Sherman avenue north, has let the general contract to W. H. Cooper, Clyde building, for an addition to cost $28,000.

HAMILTON, ONT.—The Burlington Steel Co., Sherman avenue north, has awarded the general contract to the Canadian Engineering & Contracting Co., Bank of Hamilton building, for an addition to cost $12,000.

NIAGARA FALLS, ONT.—The Niagara Wire Weaving Co., Ltd., care of C. M. Borter, architect, 102 Main street, has let the general contract on a factory to cost $60,000.

TORONTO, ONT.—W. C. Shunk, 43 Bellevue place, is making preparations to start work on a machine shop and garage.

TORONTO, ONT.—The Northern Aluminum Co., 158 Sterling road, has let the general contract for a $250,000 plant addition.

TORONTO, ONT.—The plant of the Holden-Morgan Co., 579 Richmond street west, machinists supplies, etc., recently as damaged by fire.

TORONTO, ONT.—The Crompton Car Co., Ltd., has been incorporated with $25,000 capital, to manufacture automobiles, motors, machinery, etc., by Murray H. Gillam, 773 Indian road; Morley P. van de Voort and others.

TORONTO, ONT.—The Buchanan-Duncan Motors, Ltd., has been incorporated by John Jennings, 67 Yonge street; James Buchanan, George H. Lovatt and others with $40,000 capital, to manufacture motor cars, machinery, tools, engines, etc.

TORONTO, ONT.—The Belt Grip Pulley Co. of Canada, Ltd., has been incorporated by Daniel J. Coffey, 67 Yonge street; Hugh J. Harkins, John T. Coffey and others, with $200,000 capital to manufacture pulleys, castors, trucks, carriage wheels, etc.

WALKERVILLE, ONT.—The new plant of the Canadian Products, Ltd., the Canadian subsidiary of the General Motors Corp., is rapidly nearing completion.

WESTON, ONT.—The Canada Cycle & Motor Co., Weston road, has let the general contract to the John V. Gray Construction Co., Ltd., Confederation Life building, Toronto, for an addition.

WINDSOR, ONT.—The Charles A. Strelinger Co., of Canada, Ltd., has been incorporated to manufacture machinery, etc., with $100,000 capital by Charles A. Strelinger, Charles T. Bush, Charles E. Allinger all of Detroit, Mich., and others.

Iron and Steel Prices

Corrected to Tuesday Noon

Iron Ores

Superior Ores, Per Ton, Lower Lake Ports

Old range Bessemer, 55 iron	$6.45
Mesabi Bessemer, 55 iron	6.20
Old range non-Bess., 51½ iron	5.70
Mesabi non-Bess., 51½ iron	5.55

Manganese Ore

Brazilian, 45 to 50 per cent, c.i.f. Atlantic ports, 55c per unit, nominal.

Indian, 45 to 50 per cent, c.i.f. Atlantic ports, 55c per unit, nominal.

Warehouse Prices

Steel bars, Boston	3.40c
Steel bars, Chicago	3.37c
Steel bars, Cleveland	3.27c
Steel bars, Detroit	3.38c
Steel bars, Philadelphia	3.60c
Steel bars, New York	3.37c
Steel bars, St. Louis	3.44c
Steel bars, Cincinnati	3.33c
Steel bars, St. Paul	3.595c
Steel bars, Buffalo	3.45c
Iron bars, Boston	3.40c
Iron bars, Buffalo	4.15c
Iron bars, Chicago	3.37c
Iron bars, Detroit	3.33c
Iron bars, St. Louis	3.44c
Iron bars, Cincinnati	3.33c
Iron bars, Philadelphia	3.60c
Iron bars, New York	3.37c
Shapes, Chicago	3.47c
Shapes, Detroit	3.43c
Shapes, Boston	3.50c
Shapes, St. Louis	3.54c
Shapes, St. Paul	3.695c
Shapes, New York	3.47c
Shapes, Cleveland	3.37c
Shapes, Philadelphia	3.70c
Shapes, Buffalo	3.55c
Shapes, Cincinnati	3.43c
Plates, Buffalo	3.75c
Plates, Chicago	3.67c
Plates, Detroit	3.63c
Plates, Boston	3.70c
Plates, St. Louis	3.74c
Plates, St. Paul	3.895c
Plates, New York	3.67c
Plates, Cleveland	3.57c
Plates, Philadelphia	3.90c
Plates, Cincinnati	3.63c
No. 10 blue anl. sheets, N. Y.	4.57c
No. 10 blue anl. sheets, Chicago	4.57c
No. 10 blue anl. sheets, Cleveland	3.80c
No. 10 blue anl. sheets, Boston	4.85c
No. 10 blue anl., Buffalo	4.65c
No. 10 blue anl. sheets, St. L.	4.64c
No. 10 blue anl. sheets, Cincinnati	4.53c
No. 10 blue anl. sheets, St. Paul	4.795c
No. 10 blue anl. sheets, Detroit	4.53c
No. 28 black sheets, Chicago	5.62c
No. 28 black sheets, New York	5.75c
No. 28 black sheets, Cleveland	4.60c
No. 28 black sheets, Boston	5.90c
No. 28 black sheets, Cincinnati	4.93c
No. 28 black sheets, Detroit	5.58c
No. 28 black sheets, St. Louis	5.695c
No. 28 black sheets, St. Paul	5.845c
No. 28 black sheets, Buffalo	5.70c
No. 28 galv. sheets, Chicago	6.97c
No. 28 galv. sheets, New York	7.00c
No. 28 galv. sheets, Boston	7.10c
No. 28 galv. sheets, Cleveland	5.95c
No. 28 galv. sheets, Cincinnati	6.28c
No. 28 galv. sheets, Detroit	6.93c
No. 28 galv. sheets, Buffalo	7.05c
No. 28 galv. sheets, St. Louis	7.045c
Bands, Boston	4.60c
Bands, Detroit	4.03c
Hoops, Boston	4.70c
Hoops, Detroit	4.03c
Cold rolled shafting and screw stock, New York	5.00c
Cold rolled flats, squares and hexagons, New York	5.50c

Sheet Schedule—(Black)

Differentials for gage, per 100 pounds.

No. 30	+20c
No. 29	+10c
No. 28 (carloads)	Base
No. 27	—05c
Nos. 25-26	—10c
Nos. 22-24	—15c
Nos. 17-21	—20c
Nos. 15-16	—25c
Nos. 13-14	—30c
Nos. 10-12	—35c

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28 and 30 inches ide by 72, 84, 96 and 120 inches long. Gages Nos. 14 to 28 in addition to the foregoing, 36 wide by 96 inches and 120 inches long.

Extras for width and length to be added.

Galvanized and Long Terne

Differentials for gage, per 100 pounds.

No. 30	+50c
No. 29	+25c
No. 28 (carloads)	Base
No. 27	—15c
Nos. 25-26	—30c
Nos. 22-24	—45c
Nos. 17-21	—60c
Nos. 15-16	—75c
Nos. 12-14	—90c
Nos. 10-11	—1.00

Standard Sizes

Gages Nos. 12 to 30 inclusive, 24, 26, 28, 30 and 36 inches wide by 72, 84, 96 and 120 inches long.

Extras for width and length to be added.

Freight Rates, Pig Iron

Mahoning and Shenango valleys to:

Cleveland	$1.40
Newark, N. J.	4.80
Boston	5.20
Philadelphia	4.40
Pittsburgh	1.40
St. Louis	4.60
Minneapolis, St. Paul	5.70

Buffalo to:

Albany, N. Y.	$1.80
New England (rail)	3.90
New York and Brooklyn (rail)	3.90

Virginia furnaces to:

Philadelphia	$4.10
New England	4.70
Brooklyn, Jersey City, Newark	4.40

Birmingham, Ala., to:

Boston	$8.00
Cincinnati	3.60
Chicago	5.00
Cleveland	5.00
Louisville, Ky.	3.30
Minneapolis, St. Paul	7.30
New York	7.70
Philadelphia	6.50
Pittsburgh	5.70
Savannah, Ga.	3.40
St. Louis	4.25

Chicago to:

Des Moines	$3.50
Minneapolis, St. Paul	2.50
Milwaukee	.60
Moline, Ill.	1.40
Omaha	4.50
St. Louis	1.90

Ironton and Jackson, O., to:

Chicago	$3.80
Cincinnati	1.80
Cleveland	2.40
Detroit	2.60
Indianapolis	2.30
Minneapolis, St. Paul	5.70

Freight Rates, Finished Material

Pittsburgh, carloads, per 100 lbs., to:

New York	27.0 cents
Philadelphia	24.5 cents
Boston	30.0 cents
Buffalo	21.5 cents
Baltimore	23.0 cents
Cleveland	17.0 cents
Cincinnati	23.0 cents
Chicago	27.0 cents
Detroit	23.0 cents
Minneapolis and St. Paul	49.5 cents
Denver	$1.09
St. Louis	33.5 cents
New Orleans	38.5 cents
Birmingham	57.5 cents
Pacific coast (all rail)	$1.25
Pacific coast (tin plate)	1.25

Blue Annealed

Differential for gage per 100 pounds

Nos. 8 and heavier	— 5c
Nos. 9 and 10 (carloads)	Base
Nos. 11 and 12	— 0c
Nos. 13 and 14	+10c
Nos. 15 and 16	+20c

Standard Sizes

Widths—24-26-28-30-36 and 48 inches.
Lengths—72-84-96-120 and 144 inches.
Extras for width and length to be added.

Tubular Goods

Steel Pipe

Pittsburgh basing discounts to jobbers in carloads

STANDARD WEIGHT

Butt Weld

	Black	Galv.
⅛, ¼ and ⅜-inch	50½	24
½-inch	54½	40
¾ to 3-inch	57½	44
Lap Weld		
2-inch	50½	38
2½ to 6-inch	53½	41
7 to 12-inch	50½	37
13 to 14-inch	41	..
15-inch	38½	..

PLUGGED AND REAMED

Butt Weld

1 to 3-inch	55½	42
2-inch	48½	36
Lap Weld		
2½ to 6-inch	51½	39

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼ and ⅜-inch	46½	29
½-inch	51½	39
¾ to 1½-inch	55½	43
2 to 3-inch	56½	44
Lap Weld		
2-inch	48½	37
2½ to 4-inch	51½	40
4½ to 6-inch	50½	39
7 to 8-inch	46½	33
9 to 12-inch	41½	28

DOUBLE EXTRA STRONG PLAIN

Butt Weld

½-inch	42½	32
¾ to 1½-inch	45½	35
2 to 2½-inch	47½	37
Lap Weld		
2-inch	40½	31
2½ to 4-inch	42½	33
4½ to 6-inch	41½	32
7 to 8-inch	36½	23

Wrought Iron Pipe

Pittsburgh basing discounts to jobbers in carloads

THREADS AND COUPLINGS

Butt Weld

	Black.	Galv.
⅛ and ¼-inch	29½	2½
⅜-inch	30½	3½
½-inch	34½	16½
¾ to 1½-inch	39½	23½
Lap Weld		
2-inch	32½	18½
2½ to 6-inch	34½	21½
7 to 12-inch	31½	18½

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG PLAIN ENDS

Butt Weld

⅛, ¼, ⅜-inch	28½	11½
½-inch	33½	20½
¾ to 1½-inch	39½	24½
Lap Weld		
2-inch	33½	20½
2½ to 4-inch	35½	23½
4½ to 6-inch	34½	22½
7 and 8-inch	26½	14½
9 and 12-inch	21½	9½

DOUBLE EXTRA STRONG PLAIN ENDS

Butt Weld

	Black	Galv.
½-inch	20½	8½
¾ to 1½-inch	25½	13½
Lap Weld		
2-inch	20½	8½
2½ to 4-inch	22½	13½
4½ to 6-inch	21½	12½

Lapweld Boiler Tubes

Discounts off manufacturers' standard list, in carloads; less carloads, 4 points less.

Steel

1¾ and 2-inch	19
2¼-inch	24
2½ to 3¼-inch	30½
3½ to 4½-inch	40½

Iron

1¾-inch	+20
2 and 2¼-inch	+10
2½ and 2¾-inch	+ 1
3 and 3¼-inch	— 1½
3½ to 4½-inch	—16

Electric GG Steels

SILICO-CHROME MANGANESE

SPRING STEEL ROLLED BILLETS

DIE BLOCKS

PISTON RODS

FORGED AND HEAT TREATED

FORGED CAR AXLES

Heat Treated

Superior Properties

Write for data

HAMMERED TOOL STEEL BARS

BEARING STEELS

GENERAL STEEL COMPANY

Public Service Building **MILWAUKEE, WISCONSIN**

DETROIT REPRESENTATIVE: D. J. Crowley, 832 Dime Bank Building

Iron and Steel Scrap Prices

Corrected to Tuesday Noon

Steel Works Scrap

Gross Tons Delivered to Consumer

HEAVY MELTING STEEL

Pittsburgh	$20.00 to 20.50
Chicago	18.50 to 19.00
Eastern Pennsylvania	18.50 to 19.50
Cleveland	19.00 to 19.50
St. Louis	18.00 to 18.50
Buffalo	19.00 to 20.00
New York (dealers' prices)	15.00 to 15.50
Cincinnati	17.00 to 17.50
Birmingham	20.00 to 21.00
Valleys	19.50 to 20.00
Boston (dealers)	15.50 to 16.00

BUNDLED SHEETS

Pittsburgh	$15.50 to 16.00
Eastern Pennsylvania	15.00 to 16.00
Cleveland	14.50 to 15.00
Buffalo	14.50 to 15.00
Cincinnati	12.50 to 13.00
St. Louis	11.50 to 12.00

STEEL RAILS, SHORT

Chicago	$21.00 to 21.50
Boston (dealers)	15.50 to 16.00
Cleveland	18.00 to 18.50
St. Louis	21.50 to 22.00
Birmingham	19.00 to 20.00
Cincinnati	18.00 to 18.50

STOVE PLATE

Pittsburgh	$19.00 to 20.00
Chicago	23.50 to 24.00
Eastern Pennsylvania	21.00 to 22.00
Cleveland	18.75 to 19.00
St. Louis	22.00 to 22.50
Buffalo	22.00 to 22.50
New York	17.50 to 18.00
Cincinnati	16.00 to 16.50
Birmingham	20.00 to 21.00
Boston	21.00 to 22.00

LOW PHOSPHORUS

Pittsburgh, billet and bloom crops	$24.00 to 25.00
Chicago, billet and bloom crops	24.00 to 25.00
Eastern Penn. (guaranteed)	26.50 to 27.00
Buffalo	23.50 to 24.00

SHOVELING STEEL

Chicago	$17.50 to 18.00
St. Louis	17.00 to 17.50

KNUCKLES, COUPLERS AND SPRINGS

Pittsburgh	$21.00 to 21.50
Chicago	20.50 to 21.00
St. Louis	20.50 to 21.00

BALED SHEETS

Pittsburgh	$18.00 to 18.50
Chicago	14.50 to 15.00

FROGS, SWITCHES, GUARDS

Chicago	$18.50 to 19.00
St. Louis	18.50 to 19.00
Eastern Pennsylvania	18.00 to 19.00

BOILER PLATE, CUT

Chicago, No. 1	$15.50 to 16.00
St. Louis, No. 1	15.00 to 15.50

ANGLE BARS—STEEL

Chicago	$20.00 to 21.00
St. Louis	17.50 to 18.00

Iron Mill Scrap

Gross Tons Delivered to Consumer

RAILROAD WROUGHT

Pittsburgh, No. 1	$23.00 to 24.00
Pittsburgh, No. 2	22.00 to 23.00
Chicago, No 1	21.00 to 21.50
Chicago, No. 2	19.25 to 19.50
Eastern Pennsylvania, No. 1	27.00 to 28.00
Cleveland, No. 1	23.25 to 23.75
St. Louis, No. 1	20.00 to 20.50
St. Louis, No. 2	19.00 to 19.50
Buffalo	23.00 to 23.50
Cincinnati, No. 1	19.50 to 20.00
Birmingham, No. 1	17.00 to 18.00
New York, No. 1 (dealers)	23.00
Boston (dealers)	19.00 to 19.50

WROUGHT PIPE

Eastern Pennsylvania	$19.50 to 20.50
Eastern Pennsylvania, ungraded	13.00 to 14.00
Buffalo	17.50 to 18.00
New York (dealers)	16.25 to 16.50
Boston (dealers)	15.50 to 16.00

YARD WROUGHT

Eastern Pennsylvania, No. 1	$23.00 to 23.00

CITY WROUGHT

New York, long (dealers)	19.00 to 19.50

BUSHELING

Chicago, No. 1	$18.00 to 18.50
Chicago, No. 2	12.50 to 13.00
Cleveland, No. 1	17.50 to 18.00
Cleveland, No. 2	14.50 to 15.00
St. Louis, No. 1	17.50 to 18.00
Buffalo, No. 1	16.50 to 17.50
Cincinnati, No. 1	14.50 to 15.00
Eastern Pennsylvania, No. 1	15.00 to 16.00

MACHINE SHOP TURNINGS

Pittsburgh	$12.50 to 13.00
Chicago	9.00 to 9.50
Eastern Pennsylvania	15.00 to 16.00
Eastern Pennsylvania (blast furn.)	13.00 to 14.00
Cleveland	10.75 to 11.00
Buffalo	12.00 to 12.50
New York (dealers' price)	11.00 to 11.50
St. Louis	11.00 to 11.50
Cincinnati	7.50 to 8.00
Birmingham	13.00 to 14.00
Valleys	12.00 to 12.75
Boston (dealers)	10.50 to 11.00
Boston (blast furnace) (dealers)	10.50 to 11.00

CAST IRON BORINGS

Pittsburgh	$15.50 to 16.00
Chicago	13.00 to 13.50
Eastern Pennsylvania	16.00 to 17.00
Cleveland	14.00 to 14.25
St. Louis	12.00 to 12.50
Buffalo	13.50 to 14.00
New York (dealers' price)	11.00 to 11.50
Cincinnati	9.00 to 9.50
Birmingham	13.00 to 14.00
Valleys	14.75 to 15.00
Boston (dealers)	11.50 to 12.00
Boston (blast furnace) (dealers)	11.00 to 11.50

IRON AXLES

Pittsburgh	$34.00 to 35.00
Chicago	31.00 to 32.00
Eastern Pennsylvania	35.00
Cleveland	27.00 to 28.00
St. Louis	32.00 to 32.50
Buffalo	28.00 to 29.00
Cincinnati	23.00 to 23.50

IRON RAILS

Chicago	22.50 to 23.00
Cleveland	27.00 to 28.00
St. Louis	22.50 to 23.00
Buffalo	24.00 to 25.00
Cincinnati	23.00 to 23.50

PIPES AND FLUES

Chicago	16.50 to 17.00
Cleveland	17.00 to 17.50
St. Louis	16.50 to 17.00
Cincinnati	15.00 to 15.50

GRATE BARS

Chicago	$20.00 to 20.50
Cleveland	19.00 to 19.25
Buffalo	20.00 to 20.50
New York	16.50 to 17.00
Eastern Pennsylvania	18.50 to 19.50

FORGE FLASHINGS

Cleveland, large	$14.00 to 14.50
Cleveland, small	16.50 to 17.00
Chicago, small	14.75 to 15.25
Boston (dealers)	12.00 to 12.50

FORGE SCRAP

Chicago	$19.00 to 19.50
Eastern Pennsylvania, No. 1	14.50 to 15.50
Boston	10.50 to 11.00

ARCH BARS AND TRANSOMS

Chicago	23.00 to 23.50
St. Louis	23.00 to 23.50

ANGLE BARS—IRON

Chicago	$22.50 to 23.00
St. Louis	23.50 to 24.00

Iron and Steel Works Scrap

Gross Tons Delivered to Consumer

AXLE TURNINGS

Pittsburgh	$16.00 to 17.00
Eastern Pennsylvania	16.00 to 17.00
Boston (dealers)	11.50 to 12.00
St. Louis	13.50 to 14.00
Cleveland	15.75 to 16.00
Buffalo	16.00 to 17.00
Chicago	14.50 to 15.00

STEEL CAR AXLES

Pittsburgh	$26.00 to 27.00
Eastern Pennsylvania	32.00
Cleveland	34 00 to 35.00
St. Louis	30.00 to 30.50
Buffalo	28.00 to 29.00
Chicago	28.00 to 28.50
New York (dealers)	24.00 to 25.00
Birmingham	21.00 to 22.00
Boston (dealers)	25.00 to 26.00

SHAFTING

Eastern Pennsylvania	$26.00 to 28.00
St. Louis	28.00 to 28.50
New York (dealers' price)	21.00 to 22.00
Chicago	25.00 to 25.50

Iron Foundry Scrap

Gross Tons Delivered to Consumer

CAR WHEELS

Pittsburgh, iron	$25.00 to 25.50
Pittsburgh, steel	21.50 to 22.00
Chicago, iron	23.50 to 24.00
Eastern Pennsylvania, iron	24.50 to 25.00
Cleveland, iron	22.25 to 22.75
St. Louis, iron	22.50 to 23.00
Buffalo, iron	22.50 to 23.50
Birmingham, iron	20.00 to 21.00
Birmingham, tram car	20.00 to 21.00
Boston	23.00 to 24.00
Cincinnati	20.50 to 21.00

NO. 1 CAST SCRAP

Pittsburgh, cupola	$25.00 to 26.00
Chicago, cupola	26.50 to 27.00
Eastern Pennsylvania, cupola	24.50 to 25.50
Cleveland, cupola	22.75 to 23.00
New York, cupola (dealers' price)	21.50 to 22.50
Cincinnati, No. 1, cupola	21.50 to 22.00
Birmingham, cupola	24.00 to 25.00
St. Louis, railroad	26.50 to 27.00
St. Louis, agricultural	26.00 to 26.50
Buffalo	24.50 to 25.00
Boston	28.00 to 29.00
Valleys	22.75 to 23.00

HEAVY CAST

New York (dealers)	21.00 to 22.00
Buffalo	21.00 to 22.00
Pittsburgh	22.00 to 23.00
Cleveland	17.25 to 17.50
Boston	19.00 to 19.50

MALLEABLE

Pittsburgh, railroad	$21.00 to 22.00
Pittsburgh, agricultural	20.00 to 21.00
Chicago, railroad	19.50 to 20.00
Chicago, agricultural	20.00 to 20.50
Eastern Pennsylvania, railroad	20.00 to 21.00
Cleveland, railroad	20.00 to 21.50
Cleveland, agricultural	17.50 to 18.00
St. Louis, railroad	18.00 to 18.50
St. Louis, agricultural	17.50 to 18.00
Cincinnati, railroad	15.00 to 15.50
Cincinnati, agricultural	14.50 to 15.00
Boston	19.50 to 20.50
Buffalo	19.00 to 20.00

Miscellaneous Scrap

Gross Tons Delivered to Consumer

REROLLING RAILS

5 feet and over

Pittsburgh	$25.00 to 26.00
Chicago	25.00 to 25.50
Eastern Pennsylvania	Nominal
Cleveland	26.00 to 27.00
St. Louis	25.00 to 26.50
Birmingham	22.00 to 23.00
Boston (dealers)	20.00 to 20.50

LOCOMOTIVE TIRES

Chicago	$19.50 to 20.00
St. Louis	20.00 to 20.50

BOILER PUNCHINGS

Chicago	$21.50 to 22.50
Eastern Pennsylvania	23.00 to 24.00

When the Scrap Market Is Dull

While seeking a more favorable market the best form in which to hold your sheet scrap, etc., and the form that always commands the best prices is the dense hydraulically compressed bundle.

Thus less storage space is required—under roof to prevent loss from corrosion; and because of greater car tonnage under minimum car rate, you add from 25% to 50% freight savings to your profits.

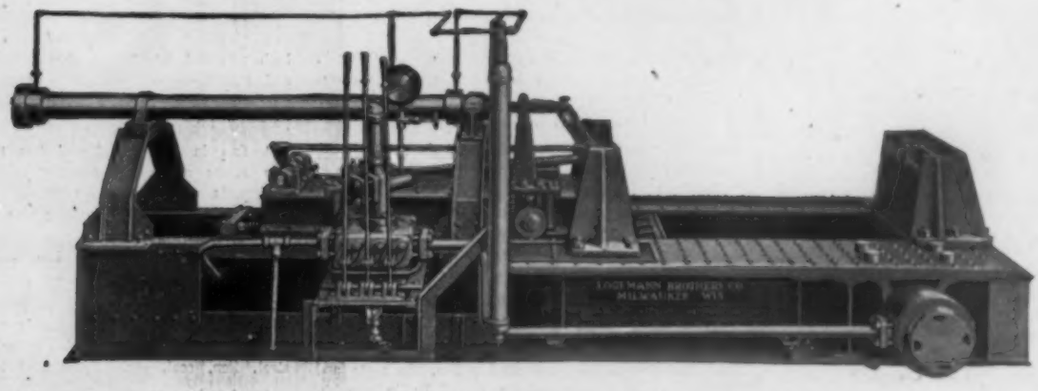
For greatest compression, largest daily output, at lowest operating cost, use

LOGEMANN Double Ram Hydraulic Scrap Metal PRESSES

You can enjoy the advantage of the accumulated experience from hundreds of Logemann scrap bundling presses now in use.

They embody a simplified mechanism that requires no special skill to operate rapidly. Press and pump are so designed that all the motive power applied is utilized, thus reducing power cost.

Powerfully built, all working parts constructed to resist the severest strains—selected material, first class workmanship—all minimize upkeep cost and insure lasting efficiency.



A medium sized press is shown; there are smaller and larger sizes in standard models.

Advise character and daily tonnage of your scrap and let us suggest press best suited to your requirements.

Logemann Brothers Co.

3126 Burleigh Street
Milwaukee, Wis.

Builders of Baling Presses and Hydraulic Machinery

New Trade Publications

OIL ENGINES.—The various parts of Diesel type oil engines, manufactured by the Allis-Chalmers Mfg. Co., Milwaukee, are illustrated in a 32-page booklet which the company recently published. It should be of value in ordering repairs and spare parts for engines of this type.

REFRACTORY MATERIAL.—The Quigley Furnace Specialties Co., New York, has published an 8-page illustrated booklet in which a refractory plastic material for bonding fire brick and kindred uses, is described and illustrated. The booklet is replete with testimonials, illustrations, etc., pertaining to the use of this material in the foundry.

MACHINE TOOLS.—The Saint Louis Machine Tool Co., St. Louis, has issued catalog No. 16, in which grinding, polishing and tapping machinery, manufactured by the company is described and illustrated. Specifications of the various machines are given as well as the various accessories, which also are illustrated.

WIRE WORK.—A 36-page illustrated booklet is being distributed by the Fred J. Meyers Mfg. Co., Hamilton, O., in which wire, iron, brass and bronze work is described. Products on which detailed information is given include machinery guards, window guards, railings, enclosures, signs, iron stairs, iron doors, fire escapes, iron fencings and gates. Each product described is illustrated.

SINTERING.—An interesting booklet on sintering and desulphurizing iron ore materials, recently was published by the American Ore Reclamation Co., New York. The booklet tells of the work of the sintering plant in its relation to the iron and steel industry, gives a description of a modern sintering plant, which is profusely accompanied with illustrations. Four line drawings in the back of the book, give the reader a comprehensive idea of various sintering machine plant layouts.

SAND MIXER.—The National Engineering Co., Chicago, is circulating an 8-page booklet in which a sand mixer is described and illustrated. The mixer consists of a stationary circular pan, in the center of which is located a vertical shaft, to which is keyed a central supporting casting or cross head. This casting rests on a turret in which are the bearings for the central shaft, which is operated by bevel gearing located below the machine. The supporting casting carries the plows and mullers. By means of a door located in the bottom of the pan, which is operated by a lever, the discharging of the sand from the mixer is easily accomplished.

REFRACTORY SAND.—A small booklet just published by the Quigley Furnace Specialties Co., New York, is devoted to a refractory granular material for use in lining and repairing, annealing furnaces, forging furnaces, heating furnaces, open-flame melting furnaces, pit-crucible furnaces, tempering furnaces, furnace doors, ladle heaters, coke-oven floors, gas retorts, flues and chambers, glass lehrs, and to make standard and special shapes for furnace walls, arches, crucible blocks, gas carburetors, etc. The material, according to the booklet, is manufactured in the electric furnace by fusing at a high temperature, a mixture of natural silica and petroleum coke. The booklet contains a number of illustrations.

CENTRIFUGAL PUMPS.—Efficiency, accessibility, durability and ruggedness of construction have been given careful consideration in a bulletin devoted to centrifugal pumps and centrifugal pumping units, recently published by the Allis-Chalmers Mfg. Co., Milwaukee. These pumps have been developed to meet pumping requirements such as city water supply, sewage pumping, service in filtration plants, underwriters fire pumps, condenser pumps, paper mill stock pumps, and for a variety of uses in modern industrial plants. The booklet is profusely illustrated and contains speed tables and charts. One part of the booklet is devoted to instructions for installing and operating horizontal centrifugal pumps. Four types of pumps manufactured by the company are described in the booklet.

MARINE BOILER DATA.—An illustrated 69-page book entitled, "Marine Boiler Logic," recently was issued by the Heine Safety Boiler Co., St. Louis. The booklet is the work of Charles H. Stoddard, consulting marine engineer for the Heine company. The main part of the book relates to the design and construction of Scotch and watertube boilers for marine installations. Evaporative capacities are worked out for the two types using coal or oil as fuel with natural or forced draft. The booklet also contains a discussion of power and speed of cargo vessels, formulas being developed showing the relation between the boiler and prime mover capacity and the dimension of the hull. In making these computations, the method developed by Rear Admiral D. W. Taylor of the United States navy has been used, with certain modifications suggested by Mr. Stoddard's experience. The last part of the book is devoted to a description of the construction and operation of the cross-drum type of watertube boiler developed by the Heine company for marine service.

TWIST DRILLS.—"Putting Mettle into Metal" is the title of an unusually attractive booklet recently issued by the Clark Equipment Co., Buchanan, Mich. The publication is devoted chiefly to descriptions and illustrations of the industrial community in which the twist drills manufactured by this company are made. The plant of the company consists of modern, well lighted buildings situated in a beautiful park and surrounded by a number of institutions designed to promote the welfare of the employes. The theater, built "to provide a suitable place for all the recreational activities of the plant" accommodates 1000 persons and is used for dances, musicales, plays, etc. It is readily transformed into a basketball court. Homes for employes, ranging in cost from $2500 to $4500 have been built and sold to employes. A well equipped hospital has been provided and turned over to an association formed among employes. The latter part of the booklet is devoted to illustrations and descriptions of the various operations through which a twist drill passes before it reaches the shipping department. A list of the sales agents of the company in the United States and foreign countries is given.

Opportunities Abroad

Requests for information should be forwarded to district or co-operative office in your district, of the Bureau of Foreign and Domestic Commerce. Each request should be on a separate sheet and be accompanied by the opportunity number

DISTRICT OFFICES

New York, 734 Customhouse; Boston, 1801 Customhouse; Chicago, 504 Federal bldg.; St. Louis, 402 Third Nat'l Bank; New Orleans, Hibernia Bank; Seattle, Henry bldg.; San Francisco, 307 Customhouse

CO-OPERATIVE OFFICES

Cleveland, Chamber of Commerce; Cincinnati, Chamber of Commerce; Los Angeles, Chamber of Commerce; Philadelphia, Chamber of Commerce; Portland, Oreg. Chamber of Commerce; Dayton, Ohio, Chamber of Commerce; Pittsburgh, Chamber of Commerce

A resident English commercial agent in Colombia desires to secure agencies for the sale of typewriters, low-priced motor cars, etc. Opportunity No. 30677.

A firm in Roumania desires to purchase technical articles, such as asbestos packings, hemp packings, rubber articles, transmission belts, cast iron water pipe and ventilators, blacksmiths' articles, pumps, agricultural and flour-mill machinery, oil well supplies, motor machinery, electrical apparatus, machinery and tools for woodworking, etc. Opportunity No. 30679.

Prices and illustrated catalogs are desired by a man in Czechoslovakia, of machinery for pressing and manufacturing lead pipes, etc. Opportunity No. 30684.

A company in Spain desires to secure an agency for the sale of iron and steel plates, tin plate and other articles. Correspondence should be in Spanish. Opportunity No. 30655.

A resident of the Philippine Islands desires to establish a small plant for the manufacture of rope and wishes to secure available information as to cost of machinery, instructions as to its care, etc. Opportunity No. 30656.

A sales agent in Salvador desires to secure agencies for the sale of corrugated, stamped and plain iron sheeting, and expanded metal for building purposes. Opportunity No. 30661.

An agency is desired by a man in Switzerland for the sale of agricultural products, tools and machinery, etc. Correspondence should be in German. Opportunity No. 30587.

A party in India desires to purchase and secure agencies for the sale of bolts, nuts, screws, nails, both wire and cut, hinges, door handles, knobs, hooks and staples, paints, varnishes, locks, builders' hardware, carpenters' tools and galvanized buckets. Opportunity No. 30660.

A firm in Czechoslovakia desires to purchase and also secure an agency for the sale of agricultural implements. Correspondence should be in either Polish or Russian. Opportunity No. 30559.

The American office of a firm in Sweden desires to be placed in communication with manufacturers with a view to securing agencies for the sale of agricultural machinery, belting, cutlery, technical and industrial machinery, locomotives, textile machines, railway supplies, construction materials, motor trucks, engines, steel, iron, coal, etc. Opportunity No. 30590.

An American export corporation is soon to send a representative to Europe and invites offers of manufacturers of iron and steel articles, hardware, machinery, farming implements, etc. Opportunity No. 30592.

A firm in Italy desires to purchase mechanical toys, optical instruments, thermometers and scientific toys, such as steam engines and electric railways. Correspondence should be in Italian or French. Opportunity No. 30596.

A mechanical engineer in Italy desires to secure an agency for the sale of builders and general hardware, tools, metals, mechanical goods, etc. Correspondence should be in Italian. Opportunity No. 30560.

The electrical engineering department of a municipality in South Africa requires electrical supplies, boiler tubes, centrifugal pump and motor, ammeters, transformers, etc. Opportunity No. 30566.

turret lathes, radial drills, goose neck drills, sensitive drills, planers, shapers, horizontal boring mills; three vertical boring mills, a milling machine, etc. The inquiry from the Canadian Fairbanks Co. is for shipment to Vancouver and specifies, one double end punch and shear, shear to have 36-inch throat, punch to have 36-inch throat to punch 1¼-inch holes in 1-inch plate; one angle iron bending machine for bending 4 x 4-inch angles; one bull dozer to bend I-beams up to 15 inches; one 1500-pound steam hammer; one gear cutting machine capable of cutting 36-inch spur gears, 2-inch circular pitch, also to cut bevel gears up to 36 inches in diameter; one horizontal boring mill, capable of boring to the center of a 102-inch circle; one gear cutting machine, suitable for cutting 36-inch spur gears, 2-inch circular pitch, also for cutting 36-inch bevel gears, 2-inch circular pitch; one 42-inch open side planer, 12-foot bed; one angle iron bender for 4 x 4-inch angles or channel irons; one double end punch and shear, to shear 1-inch plate, shear to have 36-inch throat, punch to have 36-inch throat capable of punching 1½ or 1¼-inch hole in 1-inch plate; one 1500-pound crosshead type steam hammer; one 36-inch triple geared lathe, 14 feet between centers; one 4 or 5-foot radial drill, either full universal or with universal box type table; one 3-inch bolt threader; one bull dozer, suitable for bending and straightening I-beams up to 15 inches.

A heavy demand is noted from automobile manufacturers. Among the equipment wanted by the Holmes Automobile Co., Canton, O., is some tapping machines. The F. B. Stearns Co., Cleveland, desires to obtain some automatic screw machines. The Templar Motors Corp., Cleveland, and the Peerless Motor Car Co., that city, also are understood to be in the market for some equipment. The Dort Motor Car Co., Flint, Mich., is preparing for expansion and has issued some tentative inquiries for equipment. The Hudson Motor Car Co., Detroit, and other Michigan automobile companies are in the market. The Columbia Axle Co., Cleveland, is still in the market for Warner & Swasey screw machines, tapping machines, drills, etc.

Other smaller inquiries are received from various industries. The Broadfoot Iron Works Co., Wilmington, N. C., wants a lathe, a milling machine, a key-seating machine and some other equipment. The Apex Electrical Mfg. Co., Cleveland, wants two grinders, a bandsaw, etc. The Ohio Blower Co., Cleveland, wants a 48-inch power square shear. Wilcox, Lynn & Co., Ravenna, O., machinists, want a 20 to 24-inch lathe. The United States Tire Co. and the Cleveland Osborne Mfg. Co., Inc., both of Cleveland, are in the market for some miscellaneous equipment. The Electric Vacuum Cleaner Co., also of Cleveland, has purchased a semi-automatic Frazer grinder, increasing the hourly production on a small grinding job from 40 to 1500. The Kilby Mfg. Co., Cleveland, wants a 12-foot boring mill, taking 7 feet or more under crossrail. The Aetna Brass Mfg. Co. Cleveland, still is advertising for used polishing lathes, and the Manitowoc Shipbuilding Co., Manitowoc, Wis., is asking for a heavy gate shear or Bliss type, doubled geared, double crank, press ram pressure capacity 600,000 pounds, 84 inches between housings.

Prices remain firm at recent advances. In some cases they now are within 12½ per cent of the highest prices asked during the war.

Chicago Buyers Take Light Equipment

MOST buying of machine tool equipment in the Chicago market at present is of light machinery rather than heavier types. In the experience of some dealers there is a special demand for millers and it is now difficult to place orders for reasonable delivery for the No. 2 size. This demand indicates renewed activity in small machine shops, as millers usually are bought after lathes and other primary equipment has been installed and business enlarges. This also fits into the situation which has continued over several months, buying of single tools rather than complete equipment.

Considerable demand is noted for tools to be used by manufacturers of heavier types of tractors and by refrigerating machinery manufacturers especially.

Deliveries are becoming more delayed, and 60 to 90 days is about the average. All prices which had been reduced since the first of the year have gone back to their former level and any tendency toward a change seems to be upward rather than downward. The Moline Plow Co. has not yet made inquiry for equipment for its general machine shop recently burned, and, as indicated last week, it is understood this machinery will be bought from government stocks. Montgomery, Ward & Co., who are building an engine manufacturing plant at Springfield, Ill., complete from foundry to paint shop, continues to place orders for the necessary equipment.

Construction and Equipment

Concise and Timely Business Building Opportunities from the Field of Industry

Among New England Plants

PORTLAND, ME.—The Arkin Fastener Co. has been incorporated with $60,000 capital by William Shepherd Linnell, B. L. Merryman and William M. Bradley.

PORTLAND, ME.—The Theatric Welding Co. of America, Inc., has been incorporated with $75,000 capital by James M. Graham, Charles M. Parker and Lewis G. Parker.

PORTLAND, ME.—The East Coast Fisheries Products Co. has been incorporated to build vessels and boats with $50,000,000 capital by Frank I. Cowan, H. W. Baston and Clement F. Robinson.

BOSTON.—The S. A. Woods Machine Co. plans a plant, 2-stories, 70 x 250 feet, to cost about $90,000.

BOSTON.—The S. M. S. Co. has been incorporated to manufacture machinery, motor vehicles, tires, etc., with $45,000 capital by Thomas J. Sullivan, Arthur M. Marston and Lewis W. Skillings.

BOSTON.—The R. L. Harper Co. has been incorporated to manufacture engines, motors, machines, etc., with $50,000 capital by Robert Lee Harper, Robert C. McGowan, and Henry D. Nunn.

CAMBRIDGE, MASS.—The Cambridge Machine & Tool Co. has been incorporated with $35,000 capital by Antonio Marciano, Vinent Popoli and Huran H. Seron.

EVERETT, MASS.—The Beacon Oil Co. will build